



NMAT by GMAC™

Official Guide 2020



Book

The ONLY
source of real
NMAT™
questions
from past
exams

This edition includes:

676 questions for practice

- ▶ 201 questions from past NMAT by GMAC™ exams with answer keys & explanations
- ▶ 475 additional questions with answer keys & explanations

Discussion of concepts with relevant examples



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Dear Future NMAT by GMAC™ Test Taker and Business Leader,

Preparing for the NMAT by GMAC™ exam is an important step in your graduate management education journey. *The Official Guide for NMAT by GMAC™ Review* is designed to help you achieve your personal best in its computer-adaptive format. New in 2020, the NMAT provides you with earlier result availability to target your preferred schools, as well as emphasizing preparedness over speediness.

Our 60+ years of research and experience show that proper preparation and materials are essential to achieving a competitive score on any high-stakes exam. To help you succeed, this Official Guide includes 201 questions from past NMAT by GMAC™ exams and 475 practice questions along with answer keys and explanations. You will find guidance on exam format, structure, and question type, as well as discussions of concepts within each section.

Founded in 1953, the Graduate Management Admission Council (GMAC) is a global, non-profit association of leading graduate business schools. We are actively committed to advancing the art and science of admissions by convening and representing the industry and offering best-in-class products and services for schools and students. GMAC owns and administers the Graduate Management Admission Test® (GMAT®) exam, the NMAT by GMAC™ exam, and the Executive Assessment. GMAC also manages mba.com, the

most frequently visited site for information about graduate management education.

Our mission is to connect the talent and aspirations of students globally with the opportunities provided through business and management education, and our official preparation materials are designed to help you make that connection. Using this Official Guide is an important step toward gaining admission to a high-quality business or management program of your choice.

I applaud your commitment to preparing for the NMAT by GMAC™ exam and wish you the best success throughout your education and career.

A handwritten signature in dark ink, appearing to read "Sangeet Chowfla". The signature is stylized with a large, bold "S" and a long, sweeping underline.

Sangeet Chowfla

President and CEO

Graduate Management Admission Council®

HOW TO USE NMAT BY GMAC™ OFFICIAL GUIDE 2020

NMAT by GMAC™ Official Guide has been designed with the following focus to help you study and achieve your personal best in the NMAT by GMAC™ exam:

Understand the NMAT by GMAC™ Exam Format

[Chapter 1](#) provides you in-depth information on the NMAT by GMAC™ exam format and structure, scoring pattern, and other key details.

Learn the Key Concepts

The book takes a structured approach to acing the NMAT by GMAC™ exam by first introducing you to the key theoretical concepts tested in each of the three sections—Language Skills, Quantitative Skills and Logical Reasoning.

Therefore, [Chapters 2, 4 and 6](#) are designed to provide you in-depth understanding of the key concepts and strategies for acing each section of the exam.

Apply the Key Concepts

As the next step, the book provides a practice chapter after each of the three theory-based chapters. This helps you immediately test your learning for maximum knowledge retention.

Hence, [Chapters 3, 5 and 7](#) are designed to provide you extensive practice with the help of past years' real NMAT questions as well as other practice questions.

1.0 About the NMAT by GMAC™ Exam

1.0 About the NMAT by GMAC™ Exam

The NMAT by GMAC™ exam opens doors to the leading management programmes in India, South Africa, Nigeria and Philippines with a plan to launch in other countries. The exam is brought to you by the Graduate Management Admission Council (GMAC), the organisation that owns the GMAT® exam. The NMAT by GMAC™ enables schools to recruit top talent with the comfort that the test measures the skills needed to succeed in their programmes.

Since becoming a computer-based test (CBT) in 2009, the NMAT by GMAC™ has been at the forefront of measurement within high stakes testing. The NMAT by GMAC™ exam is used for securing admissions to some of the leading graduate business programmes in India, South Africa, Nigeria and Philippines with a plan to launch in other countries. Please visit nmat.org for latest information.

1.1 Why take the NMAT by GMAC™ Exam?

The NMAT by GMAC™ exam has been, and will continue to be, a symbol of quality—enabling test takers to access graduate management education and a career of choice, while providing schools with access to top talent.

Accepted as an admissions criterion by the leading management institutions in India, South Africa, Nigeria and Philippines with a plan to launch in other countries.

Today the NMAT by GMAC™ is accepted by many leading institutions and this list is growing. Pursuing a management degree at one of these universities makes the pursuit of your dreams that much easier.

For more information, please refer to the NMAT by GMAC™ Accepting Schools section or visit www.nmat.org

Measures the skills needed to succeed in business school

When entering business school, you want to know that you have what it takes to succeed and graduate with flying colours. Having been selected using an assessment that measures the skills needed to succeed in business school gives you the confidence that you can handle the curriculum and have a fulfilling b-school experience.

Designed to give you the confidence to perform to the best of your ability

When appearing for any test, nerves are always a contributing factor in how well you perform on the day of the test. The NMAT by GMAC™ exam was designed to allay those nerves. Here are some ways that drive that confidence:

- 1. Taking the test multiple times:** You can take the NMAT by GMAC™ three times in a given Testing Year (1st July to 30th June). This gives you the confidence that you have more than a single opportunity to perform to your very best.
- 2. Choosing the section order:** The NMAT by GMAC™ allows you to choose the order in which you respond to each of the sections on the test. This allows you to play to your strengths.
- 3. No negative marking:** Sometimes you're just not sure of the right answer on the test and are running out of time. Well, you can make an informed guess instead of skipping a question without the fear of a penalty for a wrong answer. The system of no negative marking is in line with global practices.
- 4. Does not require any computer typing skills:** The NMAT by GMAC™ user interface is designed to minimise reliance on computer skills. You do not need to have prior computer experience to use CBT. No typing skills are needed. You will use the computer mouse to highlight and confirm the

selected response as each question appears on the screen. At the beginning of the test, you will receive a brief introductory tutorial that will instruct you on how to use the computer to answer questions and review responses.

Designed for your convenience

We know that you are busy and the task of registering for the test, taking the test and applying to school can be time consuming and stressful. So we've made it more convenient for you:

- 1. Choose a date, time and location of your convenience:** A long testing window allows you to choose a convenient test date of your preference.
- 2. Self-schedule:** You can choose your test appointment date, time and location in real-time based on the availability of seats at each test centre.
- 3. Register from your mobile:** This feature allows you to register anytime and anywhere.
- 4. Choose from multiple locations:** You can choose from any of the conveniently located testing centres to take the exam.
- 5. Apply to business schools after reviewing results:** You can view your test results and then decide to apply to a business school or retake the test depending on your comfort with the results you've obtained.

1.2 NMAT by GMAC™ Exam Format

1.2 NMAT by GMAC™ Exam Format

NMAT by GMAC™ is a computerised adaptive test which gives each candidate a personalised test, one question at a time, based on responses to previous questions. Due to the adaptive nature of the exam, candidates will not be able to review or change answers to preceding questions. It has three sections — Language Skills, Quantitative Skills, and Logical Reasoning. All three sections are individually timed and test takers must answer 108 questions within the total allotted time of 120 minutes. By measuring competency across three different domains, it allows schools to evaluate candidates' strengths as well as development needs.

1.3 NMAT by GMAC™ Exam Structure and Features

The NMAT by GMAC™ exam has three sections targeted at measuring different skills—Language Skills, Quantitative Skills, and Logical Reasoning.

Each candidate will receive an exam with 120 items divided into the following sections:

Language Skills	36 questions	28 minutes
Quantitative Skills	36 questions	52 minutes
Logical Reasoning	36 questions	40 minutes
Total	108 questions	120 minutes

Each section is further divided into subsections.

Candidates have a choice of selecting the order/sequence of the test sections.

The three sections of the NMAT by GMAC™ are individually timed.

1.4 NMAT by GMAC™ Scores

You can see your unofficial score at the test centre once you submit the test. Your official NMAT by GMAC™ score will be available in your NMAT by GMAC™ account within 48 hours after the test.

What is included in your score report?

Your scores will include a scaled score for each section and total score. The following table lists the range of scores possible on the different sections of the NMAT by GMAC™ exam.

Section	Score Range
Quantitative Skills	0-120
Language Skills	0-120
Logical Reasoning Skills	0-120
Total	0-360

1.5 About GMAC™

The Graduate Management Admission Council (GMAC) is a global non-profit organisation comprised of leading graduate business schools around the world. GMAC™ is the owner and administrator of the GMAT® and NMAT by GMAC™ exams.

GMAC™ believes that business and management are critical to the economic and social well-being of people worldwide. We advocate for graduate management education and its value to individuals and society.

GMAC™ strives to increase access in order to grow and diversify the candidate pool; develop assessments to meet global management education needs; and extend the value to schools with our products, services, and industry knowledge.

GMAC™ meets the needs of management schools, and current and prospective students, through a wide array of products, services, and programmes designed to open doors for students, professionals, and graduate management programmes worldwide. GMAC® also serves as the leading source of research and information about quality graduate management education.

In various Practice Sections of this book, several questions are marked as ***Real NMAT Question***. ***Real NMAT Question*** denotes that this question has appeared in an NMAT™ (now NMAT by GMAC™) exam in the past.

2.0 Quantitative Skills Review

2.0 Quantitative Skills Review

This section provides a comprehensive review of the key mathematical concepts assessed in the NMAT by GMAC™ exam. These concepts are elucidated with the help of several examples. It is recommended that you review the concepts and practice the different examples to build proficiencies.

The first section, ‘Number Properties’, includes the following topics:

1. Basics of Numbers, Fractions and Decimals
2. Divisibility of Numbers and finding Unit Digit
3. Factors, Multiples, Least Common Multiples (LCM) and Highest Common Factors (HCF)
4. Logarithm

The second section, ‘Arithmetic’, includes the following topics:

1. Percentages
2. Simple and Compound Interest
3. Profit, Loss and Discount
4. Ratio, Proportion and Averages
5. Time and Work and Partnership

The third section, ‘Algebra and Probability’, includes the following topics:

1. Equations and Inequalities
2. Sequences and Series

3. Permutations and Combinations
4. Probability

The fourth section, includes ‘DI-Caselets and Tables’:

The fifth section includes ‘DI-Graphs and Charts’

The sixth section ‘Data Sufficiency’ includes the following topics:

1. Number Properties Based
2. Arithmetic Based
3. Algebra and Probability Based

2.1 Top Tips to Prepare for Quantitative Skills

1. You will get **36 questions** in the Quantitative Skills section on the NMAT by GMAC™ exam that you will have to attempt in **52 minutes**. This means you have approximately 1.5 minutes per question.
2. This section will test you on the four important areas of Math—Number Properties, Arithmetic, Algebra and Probability.
3. Make sure you have looked at all of the questions before the time allotted for the section runs out. Evaluate each question on the basis of the time you think it would take you to solve it and its difficulty level and attempt the easier ones first since the marks are the same for each question.
4. Time is the most important resource on the NMAT by GMAC™ exam. In the actual exam, there is no option to skip a question. Therefore, it is recommended that you spend a little time in understanding the question and then decide whether you feel confident in attempting it.
5. Do not assume that questions should always be answered using the long methods you learnt in school. Most of the NMAT

by GMAC™ quant questions can be solved faster using short cuts and tricks, some of which you will learn in this book.

6. Start with the basics. Make sure you are clear on fundamental number properties, formulae and number operations concepts such as odds and evens, prime numbers, LCM and HCF, etc., before moving on to the more advanced concepts.
7. Given the time constraints, your mental math will have to be quite good to arrive at the answer quickly. So, make sure you remember multiplication tables and square of numbers up to 20. It also helps to know some common fractions and their percentage equivalents such as $12.5\% = \frac{1}{8}$, etc.
8. For Data Sufficiency questions, focus on the *sufficiency* aspect and not on the actual answer.
9. Read the question carefully so that you understand it properly before answering. Do not assume anything. A slight misinterpretation of the question can take you to an incorrect answer.
10. Take a quick look at the options before you attempt to solve a question. In some questions, it may be faster and easier to simply back-solve from the answer choices.

2.2 Number Properties

2.3 What is Measured?

The number properties section comprises topics such as basics of numbers, fractions and decimals, divisibility of numbers, finding unit digit, factors, multiples, HCF, LCM, logarithms etc.

Basic number properties test your ability to interpret and solve problems of a mathematical nature, using such operations as addition, subtraction, division and multiplication, and in a variety of problem formats and situations.

While most of the concepts in number properties are quite simple, the NMAT by GMAC™ will not always test you on straightforward concepts; rather, it will mix up two or more topics, so you may see a question that combines divisibility and LCM and HCF.

The number properties section will also test your mental math skills as you will be required to make quick calculations in your head.

2.4 Overall Test Taking Strategies

1. Read the question carefully.
2. Look at the options once before you start solving the question.
3. Be aware of the common mathematical operations.
4. Remember the divisibility rules for common numbers, frequently tested squares and cubes and multiplication tables up to 20.
5. Try to pick numbers and back-solve from the answer choices.

The next few sections will provide you with in-depth strategies for approaching each topic.

1 Basics of Numbers, Fractions and Decimals

Introduction

In order to understand quantitative skills, it is important to understand numbers as they are the basic building blocks of entire mathematics. This unit is about understanding numbers and their basic properties.

Understanding numbers

While numbers can be divided into various types, for the NMAT by GMAC™, you need to be conversant with the following types of numbers.

Natural and whole Numbers

Numbers from 0, 1, 2, 3, so on are known as whole numbers. Natural numbers do not include 0.

Rational and irrational numbers

The real numbers expressed in the form of $\frac{p}{q}$ (where $q \neq 0$) are called rational numbers. They include fractions, integers, decimals (terminating and recurring), natural numbers and whole numbers. $\sqrt[3]{27}$, -4 , 2.56 , $\frac{2}{5}$, $1.3\bar{3}$ etc. are the examples of rational numbers.

The real numbers that cannot be expressed in the form of $\frac{p}{q}$ (where $q \neq 0$) are called irrational numbers. They include non-terminating and non-recurring decimal numbers. $\sqrt[3]{6}$, $2\sqrt{5}$, $-\sqrt{8}$, $1.67834569012\dots$, etc. are the examples of irrational numbers.

Integers and fractions

Numbers -1 , 0 , 1 , 2 , etc., which have no fractional part, are called integers. Integers include the counting numbers (1 , 2 , $3, \dots$), their negative counterparts (-1 , -2 , $-3, \dots$) and 0 .





Important Learning: 0 as a number is neither a negative integer nor a positive integer. Also, 0 and all positive integers are called non-negative integers.

A fraction is a quantity that represents a part of a whole. It has two parts—a numerator and a denominator. There are two types of fractions:

- 1. Proper fractions:** Fractions of the form $\frac{A}{B}$, where A and B are integers and A is less than B, are called proper fractions. For example, $\frac{2}{3}$, $\frac{4}{7}$, $\frac{7}{11}$ and so on.
- 2. Improper fractions:** Fractions of the form $\frac{A}{B}$, where A and B are integers and A is greater than B, are called improper fractions. For example, $\frac{5}{3}$, $\frac{8}{7}$, $\frac{11}{9}$ and so on.

Important concepts about fractions

1. If the numerator is increased while keeping the denominator constant, the fraction increases in value and vice versa.
2. If the denominator is increased while keeping the numerator constant, the fraction decreases in value and vice versa.
3. A quick method of comparing two positive fractions is to multiply the numerator of the first fraction with the denominator of the second and vice versa. If the product on the left side is larger, then the left fraction is greater and if the product on the right side is larger, then the right fraction is greater.

For example, compare $\frac{3}{7}$ and $\frac{5}{11}$. On cross-multiplying, we get $3 \times 11 = 33$ and $5 \times 7 = 35$

Since $35 > 33$, the fraction that corresponds to 35, that is $\frac{5}{11}$, is greater.

Prime and composite numbers

A number which has exactly two different factors, that is, 1 and the number itself is a prime number (3, 11, 19, etc.) and a number having more than two different factors is a composite number (4, 12, 20, etc.).

Since the number 1 has only one factor that is 1 itself, it is neither a prime number nor a composite number.



Important Learning: 1 as a number is neither prime nor composite.

Some properties and observations on prime numbers are:

1. 2 is the smallest prime number.
2. 2 is the only even prime number; all other prime numbers are odd.
3. There are 25 prime numbers when counted from 1 to 100.
4. Every prime number, except 2 and 3, can be expressed as 1 more than a multiple of 6 or 1 less than a multiple of 6 (that is, $6N + 1$ or $6N - 1$).

Decimals

Decimals are numbers that fall in between integers. They express a part-to-whole relationship in terms of place value. For example, 1.2 is a decimal. The integers 1 and 2 are not decimals. An integer written as 1.0, however, is considered a decimal.

Digits and place value

There are 10 digits that make up all numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. For example, the three-digit number 412 consists of the digits 4, 1 and 2.

Every digit in a given number has a particular place value. The place value depends upon the digit's location relative to the decimal point.

Place value of digits in a number											
6	7	8	9	1	0	2	3	.	8	3	4
T E N M I L L I O N S	O N E M I L L I O N	H U N D R E D T H O U S A N D S	T E N T H O U S A N D S	T H O U S A N D S	H U N D R E D S	T E N S	O N E S	DECIMAL	T E N T H S	H U N D R E T H S	T H O U S A N D T H S

Calendars

The topic of calendar includes concepts such as odd days and leap year and finding the day of the week for a given date.

Concept of odd days

An ordinary year has 365 days, that is, 52 weeks and one odd day. This means, out of the 365 days in an ordinary year, 364 days will get converted into 52 weeks and one day will remain. This one day is referred to as 1 odd day.

Whenever we will have the case of certain number of days in our calculations, we will convert the days into weeks by dividing the total number of days by 7 and the remainder will be the number of odd days.

How the day of the week for the same date shifts from one year to the next

The concept of odd days means that when we proceed from one year to the next and the year is ordinary, that is, it has 365 days,

the day will get shifted by one day.

As an example, if the 24th of May 2014 is a Saturday, then 24th of May 2015 will be a Sunday while 24th of May 2013 would have been a Friday and so on.

A leap year has 366 days, that is, 52 weeks and two odd days. This means that when we proceed from one year to the next and the year has the effect of leap (29th February being included), and the year has 366 days, the day would get shifted by two days.

As an example, if the 24th of May 2015 is a Sunday, then 24th of May 2016 would be a Tuesday, that is, a shift of two days.



Do not commit this common error: Normally, students make the mistake of only looking at the years (from which year to which year) to decide whether the shift will be one day or two days. This is a wrong approach. When calculating the above, we need to look at not only the years but also the date from which we are moving to the other given date. If the 29th of February falls between the two dates, there will be a shift of two days, otherwise there will be a shift of one day.

Definition of a leap year

Normally, we define a leap year by saying that a year if divisible by 4 is a leap year, and if not, then an ordinary year. This definition is unfortunately not complete. The correct definition of a leap year is as follows:

An end of the century year (the last year of a century, e.g. 1900, 2000, 2100, etc.) is a leap year only if divisible by 400. For all the other years, check the divisibility by 4, and if the year is divisible by 4 it is said to be a leap year and will have 366 days.

This would mean that the year 1900 in spite of being divisible by 4 was not a leap year and the year 2100 will also not be a leap year.



Important Learning: Do you know why an end of the century year has to be divisible by 400 to be a leap year? This is because the revolution of the Earth around the Sun, which is normally said to be 365.25 days, which is what leads to an additional day being added in February, is actually 365.242 days.

Therefore, when we take 365.25 days in each year in our calculations, we are introducing an error of approximately 0.008 days in our calendar every year.

This error of 0.008 days does not seem very significant when viewed alone, but when its effect is taken for 400 consecutive years, it will introduce an error of 3 complete days in our calendar.

Therefore, it was decided that if the above mentioned error is to be corrected, then we need to add 3 days less in every 400 years, and so the 100th, 200th and 300th year are not leap years in spite of being divisible by 4. This error correction has also meant that after every 400 years, our calendar repeats itself for the next 400 years.

Counting odd days

1st January AD from where our calendar started was a Monday, and hence the reason for our week starting on a Monday, and Saturday and Sunday being called as weekends.

Therefore, if we are calculating from 1st January AD and after converting into weeks, whenever we have 1 odd day left, it would be a Monday. If there are 2 odd days left, then the first one would be a Monday, the second a Tuesday and so on. So, after converting into weeks,

First odd day = Monday

Second odd day = Tuesday

Third odd day = Wednesday

Fourth odd day = Thursday

Fifth odd day = Friday

Sixth odd day = Saturday

Seventh or zeroth odd day = Sunday

Concept of total odd days in 100, 200, 300 and 400 years

The total number of odd days form the basis of these calculations:

1. If we take 100 consecutive years from 1st January AD, there will be 24 leap years (remember the 100th year will not be a leap year) and 76 ordinary years.

24 leap years = $24 \times 2 = 48$ odd days, that is, 42 days being converted into 6 weeks and 6 odd days.

76 ordinary years = $76 \times 1 = 76$ odd days, that is, 70 days being converted into 10 weeks and 6 odd days.

Total = $6 + 6 = 12$ odd days, that is one week and 5 odd days.

So, 100 consecutive years from 1st January AD will give 5 odd days.

2. Similarly, 200 consecutive years from 1st January AD = 10 odd days, that is, 3 odd days.
3. 300 consecutive years will be 15 odd days, that is, 1 odd day.
4. But, 400 consecutive years = $20 + 1$, that is, 21 odd days, that is, 0 odd days. (This is because the 400th year will be a leap year and contribute 1 extra day.)

Also, any multiple of 400 consecutive years will always give 0 odd days. This is used along with the other four concepts to calculate a day if a date is given.

5. Also, 100 consecutive years will have 5 odd days, that is, the last day of 100 years will be a Friday. Similarly, the last day of the 200th, 300th and the 400th years will be Wednesday, Monday and Sunday, respectively.

Any two years will have the same calendar if they are both of the same type (that is, both ordinary or both leap) and the first days of both the years are the same.

Important Learning: The last day of a century will definitely be



one day out of Friday, Wednesday, Monday or Sunday. Continuing with the same logic, the first day of a new century will be a Saturday, Thursday, Tuesday or Monday.

Problem types based on calendars

Type 1

Example 1

What was the day on 24th May 2014?

- (A) Tuesday
- (B) Wednesday
- (C) Thursday
- (D) Friday
- (E) Saturday

Solution

In such questions, it would always depend on whether we have a reference point or not. As we do not have a reference point in this case, we will start our calculations from 1st January AD.

The first 2,000 years = 0 odd days

Next 13 years will have:

3 leap years $\times$ 2 odd days = 6 odd days

10 ordinary years $\times$ 1 odd day = 10 odd days = 3 odd days

For the year 2014:

January: 31 days, 3 odd days

February: 28 days, 0 odd days

March: 31 days, 3 odd days

April: 30 days, 2 odd days

May: 24 days, 24 odd days = 3 odd days

Total number of odd days for the year 2014 = $3 + 0 + 3 + 2 + 3 = 11$ odd days = 4 odd days

Total odd days = $6 + 3 + 4 = 13$ odd days = 6 odd days

Thus, 24th May 2014 will be a Saturday.

The correct answer is E.

Example 2

If 31 March 2017 is a Saturday, find the day of the week on 1 January 2014.

- (A) Wednesday
- (B) Friday
- (C) Thursday
- (D) Monday
- (E) Tuesday

Solution

The day of the week on 1 January 2014 can be determined as:

31 March 2017 is a Saturday.

31 March 2016 will be a Friday.

31 March 2015 will be a Wednesday.

31 March 2014 will be a Tuesday.

3 March 2014 (28 days before) will be a Tuesday.

28 February 2014 will be a Saturday.

31 January 2014 will be a Saturday.

3 January 2014 will be a Saturday.

So, 1 January 2014 will be a Thursday.

The correct answer is C.

2 Divisibility of Numbers and Finding Unit Digit

Now, let us look at the divisibility rules for some important numbers that will help you make quick calculations.

- 1. Divisibility rule for 2:** A number is divisible by 2 if its last digit is 0 or even, that is, 0, 2, 4, 6 or 8. All even numbers are divisible by 2. For example, the last digit of 15646790 is 0; therefore, it is divisible by 2.
- 2. Divisibility rule for 3:** A number is divisible by 3 if the sum of all the digits of the number is divisible by 3. For example, let us take the number 4,689. Now, the sum of the digits will be $4 + 6 + 8 + 9 = 27$; and since 27 is divisible by 3, the number 4,689 is also divisible by 3.
- 3. Divisibility rule for 4:** A number is divisible by 4 if the number formed by its last 2 digits is divisible by 4. Let us take the example of 4,689. The number formed by the last 2 digits is 89, which is not divisible by 4. So, the given number is not divisible by 4. Also, since 89 divided by 4 gives a remainder of 1, so 4,689 when divided by 4 will also give a remainder of 1.
- 4. Divisibility rule for 5:** A number is divisible by 5 if its last digit is 0 or 5. For example, the last digit of 567899239645 is 5; therefore, it is divisible by 5.
- 5. Divisibility rule for 6:** A number is divisible by 6 if it is divisible by both 2 and 3. For example, the last digit of 1236 is 6. It is even; hence, it is divisible by 2. The sum of its digits ($1 + 2 + 3 + 6$) is 12, which is divisible by 3. So, the given number is divisible by 6.
- 6. Divisibility rule for 7:** If the difference of twice of last digit of a number and the number formed by its remaining digits is either 0 or a multiple of 7, then the number is divisible by 7 (Repeat this process until we get a smaller number whose divisibility is known to us).

Let us check whether 1456 is divisible by 7 or not.

$$145 - (6 \times 2) = 133$$

$$13 - (3 \times 2) = 7$$

Therefore, 1456 is divisible by 7.

- 7. Divisibility rule for 8:** A number is divisible by 8 if the number formed by its last three digits is divisible by 8. For example, the last three digits of 123696 are 696. 696 is divisible by 8; therefore, 123696 is divisible by 8.
- 8. Divisibility rule for 9:** A number is divisible by 9 if the sum of all its digits is divisible by 9. For example, the sum of all the digits of 6794568 is 45 ($6 + 7 + 9 + 4 + 5 + 6 + 8$) and 45 is divisible by 9. Therefore, 6794568 is divisible by 9.
- 9. Divisibility rule for 10:** A number is divisible by 10 if its last digit is 0. For example, the last digit of 27798870 is 0. Therefore, it is divisible by 10.
- 10. Divisibility rule for 11:** If the difference between the sum of digits of a number at odd place and the sum of digits of that number at even place is either 0 or a multiple of 11, then that number is divisible by 11.

For example, the difference between the sum of digits of 23452 at odd place ($2 + 4 + 2 = 8$) and at even place ($3 + 5 = 8$) is 0 ($8 - 8$). Therefore, 23452 is divisible by 11.
- 11. For divisibility of other composite numbers:** Any number is divisible by a composite number N (where $N = m \times p$) if it is divisible by both m and p . There is a condition that m and p must be co-prime.

For example, any number is divisible by 88 if it is divisible by both 8 and 11, but, not if it is divisible by both 4 and 22.
- 12. Divisibility rule for 12:** A number is divisible by 12 if it is divisible by both 3 and 4. For example, the sum of all the digits of 7896 is 30 that is divisible by 3 and the number formed by the last two digits is 96 that is divisible by 4. So, 7896 is divisible by 12.

Example 1

If the number 2546bc is completely divisible by 3, find the possible values of $b + c$.

- (A) 2
- (B) 3
- (C) 5
- (D) 13
- (E) 17

Solution

For a number to be divisible by 3, the sum of all the digits should be divisible by 3.

Now, $2 + 5 + 4 + 6 + b + c$ should be divisible by 3.

$17 + b + c$ must be divisible by 3.

Therefore, $b + c$ must be a (multiple of 3) + 1.

That is, 1, 4, 7, 10, 13, 16, 19.

$b + c$ can take the mentioned nine values. 13 is the only value available in the options.

The correct answer is D.

Example 2

A number Q gives a remainder of 5 when divided by 7. Find the remainder when $2Q$ is divided by 7.

- (A) 2
- (B) 3
- (C) 5
- (D) 7
- (E) 9

Solution

$2Q$ when divided by 7 will give a remainder of 2×5 , that is, 10. This can be divided by 7 and the required remainder will be 3.

The other way of approaching this question is to pick a number that satisfies the criteria given in the question, that is, it should leave a remainder of 5 when divided by 7. Let us pick Q as 12. So, when $2Q$, that is, 24 is divided by 7, the remainder is 3, which is your answer. You can try this with any other number, such as 19, the result will remain the same

$$\left(\frac{38}{7} = 3\right).$$

The correct answer is B.

Word Problems on Numbers and Variables

There are a few things that need to be known before we look at various problems based on numbers and variables:

1. A two-digit number will always be written as $10x + y$ and not as xy . Similarly, a three-digit number will be written as $100x + 10y + z$. But the digits of a two-digit number will be called x and y .
2. The sum of a two-digit number and the number obtained by interchanging the digits is always divisible by 11.

$$(10x + y) + (10y + x) = 11x + 11y = 11(x + y)$$

3. The difference of a two digit number and the number obtained by interchanging the digits is always divisible by 9.
4. Any two two-digit numbers can be added to make a maximum sum of 198.

Example 3

The sum of a two-digit number and the number obtained by reversing the digits is a multiple of 88. If the difference of the

digits at the ten's place and unit's place is 6, find the digit at the ten's place of the number.

- (A) 1
- (B) 3
- (C) 5
- (D) 6
- (E) 7

Solution

Let the two-digit number be $10x + y$ and so the number obtained by reversing the digits is $10y + x$.

Their sum will be $11x + 11y$, that is, $11(x + y)$.

If $11(x + y)$ is a multiple of 88, then $x + y$ is a multiple of 8, that is, $x + y$ can be either 8 or 16.

Also, $y - x = 6$

Thus, one possible result is $y = 7$ and $x = 1$. The other result is $y = 11$ and $x = 5$, which is not possible.

The correct answer is E.

VBODMAS

VBODMAS stands for Vinculum Brackets, Of, Division, Multiplication, Addition and Subtraction. This acronym helps us remember the sequence in which to carry out arithmetic operations.

Order of Operations

V – Vinculum or Bar

The bar you see on top of the values like $\overline{x}$ must be solved first.

B – Brackets

Parts of calculation inside the brackets are always done first after the vinculum or bar.

O – Orders

Solve for orders if there is any, like powers, square roots or cube roots.

DM – Divide or multiply before addition or subtraction

AS – Do addition and subtraction in the last (from left to right).

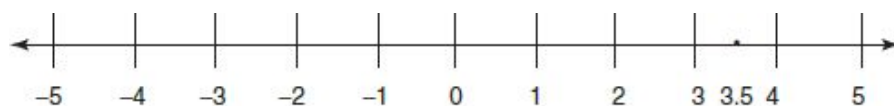
Note: ‘Of’ is used as a multiply operand in simplification.

While performing simplification, always ensure that the brackets are opened in the following order of priority, starting from (i)

- i. Bar bracket ‘----’
- ii. Circular bracket ()
- iii. Curly bracket { }
- iv. Square bracket []

Let’s take an example to simplify a statement using the BODMAS rule:

Number line and absolute value



Number line

A number line is a line on which all real numbers can be placed as per their value. Each point on the number line corresponds to a real number. For example, in the figure, above, the number 3.5 corresponds to a point on the number line which is halfway between 3 and 4.

The absolute value of a point is its distance from 0 on the number line. A positive number is already in the same form as that number’s absolute value. For a negative number, remove the

negative sign to get that number's absolute value. For example, the absolute value of -2 is 2 . The absolute value is denoted by two vertical parallel lines.



Important Learning: The absolute value of a number cannot be negative.

Largest Power of a Number in a Factorial

For Prime Numbers

Largest power of a prime number 'p' in factorial of any natural number 'N'

$$= \left[\frac{N}{p} \right] + \left[\frac{N}{p^2} \right] + \left[\frac{N}{p^3} \right] + \left[\frac{N}{p^4} \right] + \dots + \left[\frac{N}{p^n} \right], \text{ where } N \geq p^n.$$

For any non-negative integer X , $[X]$ denotes the greatest integer less than or equal to X .

For example,

$$[3.15] = 3$$

Example 4

Find the largest power of 3 in $100!$

(A) 46

(B) 47

(C) 48

(D) 49

(E) 50

Solution

$$\text{Largest power of 3 in } 100! = \left[\frac{100}{3} \right] + \left[\frac{100}{3^2} \right] + \left[\frac{100}{3^3} \right] + \left[\frac{100}{3^4} \right]$$

Note that here we cannot take $\left[\frac{100}{3^5} \right]$ as $3^5 > 100$.

Therefore, the largest power of 3 in $100! = 33 + 11 + 3 + 1 = 48$

The correct answer is C.

For Composite Numbers

In order to find the largest power of a composite number in $N!$ follow the steps given below.

1. Factorise the given number into its prime factors.
2. Find the largest power of largest prime factor of given number in $N!$.

The largest power of largest prime factor in $N!$ is the largest power of given number in $N!$.

Example 5

Find the largest power of 30 in $50!$

- (A) 10
- (B) 11
- (C) 12
- (D) 13
- (E) 14

Solution

$$30 = 2 \times 3 \times 5$$

Since largest prime factor of 30 is 5, therefore, largest power of 5 in $50!$ is the largest power of 30 in $50!$.

$$\text{Largest power of 5 in } 50! = \left[\frac{50}{5} \right] + \left[\frac{50}{5^2} \right] = 10 + 2 = 12$$

Therefore, the largest power of 30 in $50! = 12$

The correct answer is C.

Find units digit of p^q

Unit's place of p^q depends on unit's place digit of 'p' and the divisibility of power 'q'. Consider powers of 2, as we know, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$, $2^6 = 64$, $2^7 = 128$ and so on.

The units place digit for powers of 2 repeat in an order: 2, 4, 8, 6. So, the cyclicity of number 2 is 4 (that means the pattern repeats after 4 occurrences) and the cycle pattern is 2, 4, 8, 6. From this, you can see that to find the units place digit of powers of 2, you have to divide the exponent by 4.

Shortcuts to solve problems related to units place digit of p^q

1. Case 1: If 'q' is a multiple of 4

If 'p' is an even number, that is: 2, 4, 6 or 8, then the units place digit is 6

If 'p' is an odd number, that is: 1, 3, 7 or 9, then the units place digit is 1

2. Case 2: If 'q' is not a multiple of 4

Let 'r' be the remainder when 'q' is divided by 4, then units place of p^q will be equal to units place of p^r .

Cyclicity of numbers up to 9:

Number	¹	²	³	⁴	⁵	Cyclicity
2	2	4	8	6	2	4
3	3	9	7	1	3	4
4	4	6	4	6	4	2
5	5	5	5	5	5	1
6	6	6	6	6	6	1
7	7	9	3	1	7	4
8	8	4	2	6	8	4
9	9	1	9	1	9	2

Let us take some examples to understand it clearly.

- (a) The last digit for $(163)^{11}$ is the same as that of 3^{11} , that is, $3^{4 \times 2 + 3}$ which is the same as the last digit for 3^3 , that is, last digit for 27 and so our last digit for $(163)^{11}$ is 7.
- (b) Last digit for $(29)^{19}$ is the same as that of 9^{19} , that is, $9^{2 \times 9 + 1}$ which is the same as the last digit for $9^1 = 9$.

3 Factors, Multiples, Least Common Multiple and Highest Common Factor

Factors and Multiples

A factor is a number that is able to completely divide a number greater than or equal to it. For example, 2 is a factor of 4 and 3 is a factor of 15, but 2 is not a factor of 15.

On the other hand, a multiple is a number that may be divided by another number a certain number of times without leaving a remainder. So, 4 is a multiple of 2, 15 is a multiple of 3, but 15 is not a multiple of 2 since dividing 15 by 2 will leave a remainder of 1.

Factor foundation rule

If a is a factor of b and b is a factor of c , then a is also a factor of c . For example, 3 is a factor of 9 and 9 is a factor of 81. Therefore, 3 is also a factor of 81.

Prime factorisation

Prime factorisation is a way to express any number as a product of prime numbers. For example, the prime factorisation of 30 is $2 \times 3 \times 5$. Prime factorisation is useful in answering questions about divisibility.

Example 1

Given that $1,176 = 2^p \times 3^q \times 7^r$, find the value of $p + q + r$.

- (A) 6
- (B) 8
- (C) 9
- (D) 10
- (E) 12

Solution

The given number can be written as below:

$$1176 = 4 \times 294 = 4 \times 3 \times 98 = 4 \times 3 \times 2 \times 49 = 2^3 \times 3^1 \times 7^2$$

Since $1176 = 2^p \times 3^q \times 7^r$, therefore, $p = 3$, $q = 1$ and $r = 2$

Hence, $p + q + r = 3 + 1 + 2 = 6$

The correct answer is A.

Highest Common Factor (HCF)

We already have an understanding of what is a factor. The Highest Common Factor or HCF is the highest common factor among all the factors of a set of given numbers. It is also known as the

Greatest Common Factor (GCF) or the Greatest Common Divisor (GCD). For example, the HCF of 24 and 40 will be 8, since 8 is the largest number that can completely divide both 24 and 40.

Least Common Multiple (LCM)

The Least Common Multiple or LCM is the least common multiple of any set of given numbers. LCM refers to the smallest multiple of two (or more) integers. Multiples will be equal to or larger than the given integers. The LCM of 6 and 15 is 30, because 30 is the smallest number that both 6 and 15 go into.

Properties of HCF and LCM

Following are properties of HCF and LCM:

1. For any set of given numbers, the LCM is always a multiple of the HCF.
2. For two given numbers, product of the numbers is equal to the product of their HCF and LCM. (This property will also hold true for 3 numbers, 4 numbers and so on, provided none of them have a common factor other than 1.)
3. For a set of given fractions

$$\begin{aligned}\text{LCM of fractions} &= \frac{\text{LCM of the numerator}}{\text{HCF of the denominator}} \\ \text{HCF of fractions} &= \frac{\text{HCF of the numerator}}{\text{LCM of the denominator}}\end{aligned}$$

Before doing this, we need to bring the fractions to the smallest or lowest form.

Example 2

What is the smallest integer which is greater than 1 and which leaves a remainder of 2 when divided by any of the integers 3, 5 and 7?

(A) 18

- (B) 38
- (C) 105
- (D) 107
- (E) 213

Solution

You start by finding out the smallest number that is divisible by 2, 5 and 7 (which will be their LCM) and add 2 to the result.

The LCM of 3, 5 and 7 is 105, so our desired answer is $105 + 2 = 107$.

The correct answer is D.

Example 3

What minimum number must be subtracted from 247 so that the number is divisible by both 6 and 7?

- (A) 35
- (B) 36
- (C) 37
- (D) 38
- (E) 39

Solution

LCM of 6 and 7 is 42.

We need to find out a multiple of 42 closest to 247.

42×5 , that is, 210 is the multiple of 42 closest to 247 and so the value to be subtracted from 247 so that the number left is completely divisible by both 6 and 7 = $247 - 210 = 37$.

The correct answer is C.

4 Logarithm

Definition: Every positive real number N can be expressed in exponential form as

$$N = a^x \quad (1)$$

Where 'a' is also a positive real different than unity and is called the base and 'x' is called the exponent.

We can write the relation (1) in logarithmic form as

$$\log_a N = x \quad (2)$$

Hence the two relations

$$\left. \begin{array}{l} a^x = N \\ \text{and } \log_a N = x \end{array} \right\}$$

are identical where $N > 0$, $a > 0$, $a \neq 1$

Hence logarithm of a number to some base is the exponent by which the base must be raised in order to get that number. Logarithm of zero does not exist and logarithm of (–) ve reals are not defined



Important Learning: Unless stated otherwise, we assume the base to be 10.

Important Formula

1. $\log(ab) = \log a + \log b$
2. $\log(a/b) = \log a - \log b$
3. $\log(a)^n = n \log a$
4. $\log_a b = \log b / \log a$ (to any base)

The logarithm of 1

Recall that any number raised to the power zero is 1: $a^0 = 1$.

The logarithmic form of this is

$$\log_a 1 = 0$$



Important Learning: $\log_b a = \frac{1}{\log_a b}$.

2.5 Arithmetic

2.6 What is Measured?

The arithmetic section comprises topics such as averages, profit and loss, ratio and proportion, percentages, simple and compound interest, mixtures, calendars, etc.

Basic arithmetic questions test your ability to interpret and solve problems of a mathematical nature, using such operations as addition, subtraction, division and multiplication, and in a variety of problem formats and situations.

While most of the concepts in arithmetic are quite simple, the NMAT by GMAC™ will not always test you on straightforward concepts; rather, it will mix up two or more topics, so you may see a question that combines percentages and ratio and proportion.

The arithmetic section will also test your mental math skills as you will be required to make quick calculations in your head.

2.7 Overall Test Taking Strategies

1. Read the question carefully.
2. Look at the options once before you start solving the question.
3. Remember the frequently tested squares and cubes and multiplication tables up to 20.
4. Be clear about the equivalent of common fractions as percentage and also about decimal terms.
5. Try to pick numbers and back-solve from the answer choices.

The next few sections will provide you with in-depth strategies for approaching each topic.

1 Percentages

Introduction

Percentage is an important topic in the NMAT by GMAC™, not only because you may be asked questions specifically related to percentages, but also because the knowledge of percentages helps you to easily understand and attempt problems from other areas in arithmetic.

Also, the understanding of percentages forms an important aspect of data interpretation (DI), in which questions require you to calculate percentage values, growth rates and other percentage changes.

So, what is a percentage? Any value expressed on a base of 100 or over a base of 100 is called percentage and is represented as % (cent represents the base 100).

A fraction is another way in which the value of a particular percentage can be represented. Therefore, one can say that percentages and fractions are equivalent and can be converted into one another as per the need. For example, 25% is the same as $\frac{1}{4}$, 33.33% is the same as $\frac{1}{3}$, 50% is the same as $\frac{1}{2}$ and so on.

1. To convert a percentage into a fraction, divide the percentage by 100.

For example, 20% is same as $\frac{20}{100} = \frac{1}{5}$.

2. Similarly, to convert a fraction into a percentage, multiply the fraction by 100.

For example, $\frac{2}{5} = \frac{2}{5} \times 100 = 40\%$

Percentage equivalent of fractions

We need to know the percentage equivalent of fractions in order to enhance our understanding of percentages as a concept and to

help in quick calculations.

For example, the percentage equivalent of $\frac{1}{2}$ will be $\left(\frac{1}{2}\right) \times 100 = 50\%$.

Instead of saying $\frac{1}{2}$ or half of any value, we can also say that we are calculating 50% of the given value.

Students must know the percentage equivalent of fractions up to $\frac{1}{20}$.

Let us look at some of these values:

$\frac{1}{1} = 100\%$	$\frac{1}{2} = 50\%$	$\frac{1}{3} = 33.33\%$	$\frac{1}{4} = 25\%$	$\frac{1}{5} = 20\%$
$\frac{1}{6} = 16.67\%$	$\frac{1}{7} = 14.28\%$	$\frac{1}{8} = 12.5\%$	$\frac{1}{9} = 11.11\%$	$\frac{1}{10} = 10\%$

Percentage Change

1. Percentage Change
$$\frac{\text{Final value} - \text{Initial value}}{\text{Initial value}} \times 100$$

Percentage Increase/Decrease

2. Percentage increase
$$= \frac{\text{Actual increase}}{\text{Initial quantity}} \times 100$$

3. Percentage decrease
$$= \frac{\text{Actual decrease}}{\text{Initial quantity}} \times 100$$

4. If the price of a commodity increases by R%, then the reduction in consumption so as not to change the expenditure is
$$\left[\frac{R}{(100 + R)} \times 100 \right] \%$$

5. If the price of a commodity decreases by R%, then the increase in consumption so as not to change the expenditure is

$$\left[\frac{R}{(100 - R)} \times 100 \right] \%$$

Example 1

If the price of a commodity increases by 20%, then by what percentage the consumption should be reduced so as not to increase the expenditure?

- (A) 12.5%
- (B) 14.28%
- (C) 16.67%
- (D) 18.12%
- (E) 20.25%

Solution

$$\text{Required percentage} = \frac{20}{100 + 20} \times 100 = \frac{20}{120} \times 100 = 16.67\%$$

The correct answer is C.

Results on Population

Let the population of a town be P now and suppose it increases at the rate of R% per annum, then:

1. Population after n years = $P \left(1 + \frac{R}{100} \right)^n$
2. Population n years ago = $\frac{P}{\left(1 + \frac{R}{100} \right)^n}$

Results on Depreciation

Let the present value of a machine be P. Suppose it depreciates at the rate of R% per annum. Then:

1. Value of the machine after n years = $P \left(1 - \frac{R}{100} \right)^n$

2. Value of the machine n years ago = $\frac{P}{\left(1 - \frac{R}{100}\right)^n}$

Successive Percentage Change

If any quantity is increased by x%, then y% and later on z%, then the overall or effective percentage increase is:

$$\left[\left(\frac{100+x}{100} \right) \left(\frac{100+y}{100} \right) \left(\frac{100+z}{100} \right) - 1 \right] \times 100$$

Successive Percentage Change Formula

When a number increases by A% and then by B%, the overall percentage increase is equal to

$$\left(A + B + \frac{AB}{100} \right) \%$$

Example 2

A number is increased by 20% and then the increased number is again increased by 10%. What is the total increment in the number?

- (A) 30%
- (B) 31%
- (C) 32%
- (D) 33%
- (E) 34%

Solution

$$\text{Required percentage} = 20 + 10 + \frac{20 \times 10}{100} = 20 + 10 + 2 = 32\%$$

The correct answer is C.

Application of Successive Percentage Change Formula

We can use successive percentage change formula to solve percentage-related problems where the product of two quantities equals the third quantity. For example,

$$\text{Length} \times \text{Breadth} = \text{Area}$$

$$\text{Price} \times \text{Quantity purchased} = \text{Expenditure}$$

Multiplication factor

To find the value of R% of a number, we multiply that number by $\frac{R}{100}$. If we want to find out 35% of a given number, we need to multiply the number by $\frac{35}{100}$ or 0.35.

To increase a number by R%, we multiply the number by $\frac{(100+R)}{100}$, and to decrease a number by R%, we multiply the number by $\frac{(100-R)}{100}$.

We need to understand that finding out R% of a number and increasing or decreasing a given number by R% are different operations.

The factor with which we multiply a number in order to (a) find the value of certain percentage of a given number, (b) increase the value of a number by a particular percentage or (c) decrease the value of a number by a particular percentage is called the **multiplication factor**.

For example, if we have to increase 120 by 20%, we need to multiply 120 by $\frac{(100+20)}{100}$ or $\frac{120}{100}$ or 1.2. In this case, 1.2 is the multiplication factor. The result is $120 \times 1.2 = 144$. Therefore, if we increase 120 by 20%, the final result will be 144.

Let us look at the multiplication factor for some cases:

1. To increase a number by 17%, the multiplication factor will be $\frac{(100+17)}{100} = 1.17$.
2. To decrease a number by 11%, the multiplication factor will be $\frac{(100-11)}{100} = 0.89$.
3. To increase a number by 34%, the multiplication factor will be $\frac{(100+34)}{100} = 1.34$.
4. To decrease a number by 30%, the multiplication factor will be $\frac{(100-30)}{100} = 0.7$.
5. To find 40% of a number, the multiplication factor will be 0.4.



Important Learning: If A is 20% more than B, then B will not be 20% less than A.

Base and base change

In percentages, it is very important to understand the base on which the change is happening. For example, let us take two numbers, say 40 and 50, and carry out the following operations:

1. Determine what percent of 40 is 50.

For this, we need to express 50 as a percentage of 40, that is, $\left(\frac{50}{40}\right) \times 100 = 125\%$. Therefore, 50 is 125% of the given value 40.

2. Express 40 as a percent of 50.

For this, we need to find out 40 as a percentage of the given base value, that is, 50. Therefore, $\left(\frac{40}{50}\right) \times 100 = 80\%$



Do not commit this common error: There are two things that a student must appreciate. 50% is what percentage of 40% and 50% is how much more than 40% are two different problems. In this example, we are being asked about how much more is 50%

than 40%. Many students make the mistake of saying that the required answer is 10%, which is the difference between the given values 50 and 40. The percentage affixed after the given values probably creates this confusion. What if the two values were 50 km/h and 40 km/h, that is, speed, or 50 kg and 40 kg, that is, weight?

Points to Remember

Some points to remember while resolving percentage related problems are listed as follows:

1. $A\% \text{ of } B = B\% \text{ of } A$

For example, $20\% \text{ of } 80 = 80\% \text{ of } 20 = 16$

2. If percentage increase in initial quantity is $k\%$, then the new value $= \left(\frac{k}{100} + 1\right) \times \text{Initial quantity}$.

3. If new quantity becomes k times the old quantity, then the percentage increase is $(k - 1) \times 100\%$. For example, if a quantity becomes 5 times of its initial value, then the percentage increase is 400%.

4. If A is $k\%$ more than B, then B is $\frac{k}{(100 + k)} \times 100\%$ less than A.

5. If A is $k\%$ less than B, then B is $\frac{k}{(100 - k)} \times 100\%$ more than A.

6. If the price of a commodity increases by $k\%$, then to keep expenditure constant, decrease in consumption is $\frac{k}{(100 + k)} \times 100\%$.

7. If the price of a commodity decreases by $k\%$, then to keep expenditure constant, increase in consumption is $\frac{k}{(100 - k)} \times 100\%$.

8. If increase in price is $\frac{1}{x}$ of the original price, then decrease in quantity purchased so that expenditure remains unchanged is equal to $\frac{1}{x+1}$ of the original quantity and vice versa; where x is a natural number. For example, if price increases by 16.67% or $\frac{1}{6}$,

then in order to keep the expenditure unchanged, the quantity has to be decreased by $\frac{1}{7}$ or 14.28% of its original value.

9. For the same expenditure, if increase in the quantity purchased is $\frac{1}{x}$ of the original quantity, then decrease in price is equal to $\frac{1}{x+1}$ of the original price and vice versa; where x is a natural number.

For example, if for the same expenditure, increase in quantity purchased is 20% or $\frac{1}{5}$ of the original quantity, then decrease in price is equal to 16.67% or $\frac{1}{6}$ of original price.

Example 3

In a class having 60% girls, 40% of the students qualified in a test. If 50% of the girls qualified, find the number of boys who did not qualify in the test as a percentage of the total strength of the class?

- (A) 10%
- (B) 30%
- (C) 45%
- (D) 55%
- (E) 90%

Solution

Therefore, as a percentage of the total strength of the class, 30% of the boys have not qualified. Let the total number of students in the class be 100. Then the number of girls = 60 and number of boys = 40. Total number of students who qualified = 40% of 100 = 40. Of those 40 students, 30 are girls (since 50% of the girls have qualified and 50% of 60 = 30). So, 10 boys have qualified, which means that 30 boys have not qualified.

The correct answer is B.

2 Simple and Compound Interest

Interest

Interest is an additional amount that a person gets against investment of capital. Interest earnings can be of two types: Simple Interest (SI) and Compound Interest (CI). Let us look at and understand both of them.

Simple Interest (SI)

The basic formula for Simple interest is

$$SI = \frac{P \times R \times T}{100}$$

where P is the Principal, R is the rate % per annum and T is the time period (in years) of investment.

Compound Interest (CI)

Compound interest is calculated on the principal amount and also on the accumulated interest of previous periods. This compounding effect can make a big difference to the total interest payable on a loan.

The following basic formula is used for calculating compound interest. The formula calculates the amount, using which the interest can be calculated, that is

$$A = P \left(1 + \frac{R}{100} \right)^n$$

where A is the amount, P is the Principal, R is the rate % applicable and n is the number of periods.

Compound Interest calculation if interest is payable more than once a year

If interest is paid before completion of the year, then amount

$$A = P \left(1 + \frac{R}{100p} \right)^{np}$$

where p = number of times interest is paid in 1 year and n is number of years. So, if interest is paid semi-annually, quarterly or monthly, the value of p is 2, 4 and 12 respectively.



Important Learning:

1. In the first period, SI and CI are equal. In all the other periods after the first period, the CI is greater than the SI.
2. In simple interest, the total rate of interest applicable is the sum of all the respective rates applicable.
3. In compound interest, the total rate of interest applicable is the successive effect of the respective rates given.
4. If an amount becomes N times itself in T years at SI, then the required rate of Interest $R = \frac{(N-1)}{T} \times 100\%$
5. Difference between compound interest and simple interest
 - a. For Two years, $CI - SI = P \left(\frac{R}{100} \right)^2$
 - b. For Three years, $CI - SI = P \left(\frac{R^2}{100^2} \right) \times \frac{300 + R}{100}$
6. Ratio of CI and SI for two years, $\frac{CI}{SI} = \frac{200 + R}{200}$

Example 1

The simple interest for 10 years is Rs. 6,000. The compound interest for 2 years is Rs. 1,400. Find the rate of interest and the principal.

- (A) 30%, 1,800
- (B) 33.33%, 1,600
- (C) 33.33%, 1,800
- (D) 35%, 1,500
- (E) 66.66%, 1,600

Solution

SI for 10 years is Rs. 6,000.

Therefore, SI for 1 year will be Rs. 600.

SI for 2 years will be Rs. 1,200.

CI for 2 years is Rs. 1,400.

Difference = Rs. 200. This is because of interest received on the first period's interest.

Therefore,

$$200 = 600 \times \frac{R}{100}$$

Therefore,

$$R = \frac{200}{6} = 33.33\%$$

Also, interest for the first period is Rs. 600, rate is 33.33% and time period is 1 year. Therefore,

$$600 = \frac{P \times 33.33 \times 1}{100} \Rightarrow P = \text{Rs. } 1,800$$

The correct answer is C.

3 Profit, Loss and Discounts

Introduction

Profit is an additional amount that a customer pays in return for buying an item that is owned by or sold by someone else.

$$\text{Profit} = \text{SP} - \text{CP}$$

where SP is the selling price, that is, the price at which the item is sold, and CP is the cost price, that is, the price at which it was originally manufactured or purchased by the seller.

When profit is expressed as a percentage of CP, it is known as profit %. Therefore,

$$\text{Profit \%} = \frac{(\text{SP} - \text{CP})}{\text{CP}} \times 100$$

Sometimes, the product is sold at a price lower than the CP. This is called loss.

Loss can be written either as (CP - SP), in which case it has a positive sign or (SP - CP), in which case it has a negative sign. So, loss = SP - CP.

$$\text{Loss \%} = \frac{(\text{SP} - \text{CP})}{\text{CP}} \times 100$$



Important Learning: Profit or loss % is always expressed as a percentage of the cost price.

Example 1

50 kg of a product is sold and the profit generated is equal to the cost price of 20 kg of the product. Find the profit percentage made.

- (A) 20%
- (B) 25%
- (C) 35%
- (D) 40%

(E) 45%

Solution

As per the problem, we have:

SP of 50 kg – CP of 50 kg = CP of 20 kg

Or, CP of 70 kg = SP of 50 kg

Therefore, $\frac{70 - 50}{50} \times 100 = 40\%$

The correct answer is D.

False weights

If an item is claimed to be sold at cost price using false weights, then the overall percentage profit is given by

$$\text{Percentage Profit} = \left(\frac{\text{Claimed weight of item}}{\text{Actual weight of item}} - 1 \right) \times 100$$

Example 2

A dishonest dealer claims to sell his good at cost price but uses a false weight, which reads 1000 gm for 800 gm. What is his net profit percentage?

(A) 20%

(B) 25%

(C) 35%

(D) 40%

(E) 45%

Solution

Required percentage $\left(\frac{1000}{800} - 1 \right) \times 100 = \frac{200}{800} \times 100 = 25\%$

The correct answer is B.

Discount

A discount is a reduction in the marked (or list) price of an article. “25% discount” means a reduction of 25% in the marked price of an article. For example, if the marked price of an article is Rs. 400, it is sold for Rs. 300, that is, Rs. 100 less than the marked price.

Let us define the following:

Marked Price (or List price)

The marked price (M.P.) of an article is the price at which the article is listed for sale. Since this price is written (marked) on the article, so it is called the marked price.

Net Selling Price (S.P.)

In case of discount selling, the price of the article obtained by subtracting discount from the marked price is called the Net Selling price or Selling price (S.P.).

$$\text{Discount} = \text{Marked Price} - \text{Selling Price}$$

$$\text{Discount Percentage} = \frac{\text{Discount}}{\text{Marked Price}} \times 100$$

Successive Discounts

When a discount of $a\%$ is followed by another discount of $b\%$, then

$$\text{Total discount} = a + b - \frac{ab}{100}$$

Important points and formulae

1. While the mark-up is always calculated as a percentage of the cost price, discount % is always calculated as a percentage of the marked price.
2. If two items are sold for Rs. x each, the first one at a profit of $P\%$ and the other at a loss of $P\%$, then the overall loss will be =

$$\left(\frac{P^2}{100}\right)\%.$$

3. When the CP and SP are either both increased or both decreased by the same percentage, there is no change in the existing profit % or loss %.
4. If two discounts are A% and B%, then the single equivalent discount = $\left(A + B - \frac{AB}{100}\right)\%$
5. If a person wants to make a profit of A% after giving a discount of B%, then the Marked Price, $MP = CP \times \frac{100 + A}{100 - B}$

4 Ratio, Proportion and Average

Introduction

Ratio is a comparison between two or more similar quantities having the same dimensions; therefore, ratio happens to be a dimensionless quantity.

For example, when we mention that the speed of two persons A and B is in the ratio 2:3, we do not ask whether the speed is in km/h or m/s, as the ratio is a simple comparison between two similar variables or values.

A ratio and fraction are synonymous yet different entities. When we say that a:b is 2:3, we are talking about the ratio. Ratios are used to make comparisons, but when we need to find the individual contributions or values, fractions are required for the same.

Therefore, if a:b is 4:3, we understand that for every value of 4 that a gets, b will get a value of 3, and so a gets a value of 4 for every 7 that they get together. This is known as a fraction.

Fraction of a is $\frac{4}{(4+3)}$, that is $\frac{4}{7}$, and fraction of b is $\frac{3}{(3+4)}$, that is $\frac{3}{7}$.

Important characteristics and formulae related to ratios

Some of the basic properties of ratios are listed below:

1. If both the antecedent and the consequent are multiplied or divided by the same number (except 0), the ratio will remain the same, i.e.

$$\frac{a}{b} = \frac{ka}{kb} \text{ or that, } \frac{a}{b} = \frac{a/k}{b/k}$$

2. Duplicate ratio refers to the ratio of the squares of the antecedent and the consequent. Duplicate ratio of $x : y = x^2 : y^2$.
3. Triplicate ratio refers to the ratio of the cubes of the antecedent and the consequent. Triplicate ratio of $x : y = x^3 : y^3$.
4. Sub-duplicate ratio refers to the ratio of the square roots of the antecedent and the consequent. Sub-duplicate ratio of $x : y = \sqrt{x} : \sqrt{y}$.
5. Sub-triplicate ratio refers to the ratio of the cube roots of the antecedent and the consequent. Sub-triplicate ratio of $x : y = \sqrt[3]{x} : \sqrt[3]{y}$.
6. Inverse ratio is derived by interchanging the positions of the antecedent and the consequent. Inverse ratio of $x : y = y : x$.
7. If the denominator of two ratios is same, then the ratio with larger numerator is greater than the ratio with the smaller numerator.
8. If we are given that $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{g}{h} = k$, then

$$k = \frac{a+c+e+g}{b+d+f+h}$$

9. If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a}{b} = \frac{c}{d} = \frac{a+c}{b+d}$

Important Learning: Ratio between two quantities or variables is only a comparative measure. It does not tell you anything about

the actual values. For calculating actual values, you need to use fractions.

Example 1

The sum of the ages of the five members in a family is 124 years. If the ages of the children are in the ratio 3:4:5 while the combined age of their parents is 76, find the age of the youngest child.

- (A) 8
- (B) 12
- (C) 13
- (D) 14
- (E) 15

Solution

Combined age of the three children = $124 - 76 = 48$ years

Age of the youngest child will be: $\frac{3}{12} \times 48 = 12$ years

The correct answer is B.

Proportion and variation

Proportion is directly connected to ratios. Basically, a proportion is a statement that tells us that two ratios are equal. It can be written in two ways:

1. Two equal fractions, $\frac{a}{b} = \frac{c}{d}$ or
2. Using a colon, $a:b = c:d$

When two ratios are equal, the cross-multiplication of the ratios is also equal. For example,

$$\frac{2}{9} = \frac{6}{27} \Rightarrow 2 \times 27 = 6 \times 9$$

Important Characteristics and Formulae Related to Proportions

Some of the basic properties of proportions are listed below:

1. Since $\frac{a}{b} = \frac{c}{d}$, the product of extremes is equal to the product of means, i.e. $ad = bc$.
2. If a proportion is such that $a : x :: x : b$, then x is called the mean proportional or the second proportional of a and b .
3. If a proportion is such that $a : b :: b : x$, then x is called the third proportional to a and b .
4. **Componendo rule:** If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a+b}{b} = \frac{c+d}{d}$
5. **Dividendo rule:** If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a-b}{b} = \frac{c-d}{d}$
6. **Componendo and Dividendo (C and D) rule:** If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a+b}{a-b} = \frac{c+d}{c-d}$
7. If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a}{b} = \frac{a+c}{b+d} = \frac{a-c}{b-d} = \frac{c}{d}$
8. **Invertendo rule:** If $\frac{a}{b} = \frac{c}{d}$, then $\frac{b}{a} = \frac{d}{c}$
9. **Alternendo rule:** If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a}{c} = \frac{b}{d}$

Example 2

Three solutions having milk and water in the ratio 2:3, 3:1 and 4:5, respectively, were mixed in the ratio 2:3:4. Find the ratio of milk to water in the resultant mixture.

- (A) 869:751
- (B) 219:341
- (C) 420:519
- (D) 531:622
- (E) 640:729

Solution

Let the solutions added be 2, 3 and 4 L, respectively.

Then, the quantity of milk in the solution is as below:

$$\begin{aligned} &= 2 \times \frac{2}{5} + 3 \times \frac{3}{4} + 4 \times \frac{4}{9} = \frac{4}{5} + \frac{9}{4} + \frac{16}{9} \\ &= \frac{144 + 405 + 320}{180} = \frac{869}{180} \end{aligned}$$

And, the quantity of water in the solution is as below:

$$= 9 - \frac{869}{180} = \frac{1620 - 869}{180} = \frac{751}{180}$$

Therefore, ratio of milk to water = 869:751

The correct answer is A.

Direct proportionality

Y is said to be directly proportional to X if Y increases as X increases and Y decreases as X decreases. Here, Y is called the dependent variable, while X is called the independent variable.

We can write the relation in the form $Y = KX$, where K is called the constant of proportionality.

Applications of direct proportionality

1. Distance covered is directly proportional to speed if time of travel is constant.
2. Amount of work done is directly proportional to the number of people if the number of days is constant.

Inverse proportionality

Y is said to be inversely proportional to X if Y decreases as X increases and Y increases as X decreases.

We can write the relation in the form $Y = \frac{K}{X}$, where K is called the constant of proportionality.

Applications of inverse proportionality

1. Time taken is inversely proportional to speed if distance is constant.
2. Number of days is inversely proportional to the number of people if the amount of work done is constant.

Age-related problems

Problems based on ages are a simple application of the concept of ratios. In all problems of ages, we need to follow the instructions given in the problem keeping the time shift in consideration.

Important Points

1. We can take the unknown variable as the current age of the persons in the question or their age a few years earlier or a few years later. The answer will be the same, provided we keep the time shift in consideration.
2. The difference between the ages of two persons will always be the same whether the calculation is done today, a few years earlier or a few years later.
3. If the average age of a family of n members is x today, after three years, the average age of the family will be $x + 3$.

Example 3

Three years ago, the ratio of the ages of a father and a son was 6:1. After 3 years, the ratio will be 36:11. Find the present age of the son.

- (A) 3 years
- (B) 5 years
- (C) 8 years
- (D) 11 years
- (E) 17 years

Solution

Let the ages of father and son three years ago be $6x$ and x . Today their ages will be $6x + 3$ and $x + 3$ and after 3 years their ages will be $6x + 6$ and $x + 6$.

Now,

$$\frac{6x+6}{x+6} + \frac{36}{11}$$

$$\Rightarrow \frac{x+1}{x+6} = \frac{6}{11}$$

$$\Rightarrow 5x = 25$$

$$\Rightarrow x = 5$$

Present age of the son will be $x + 3$, that is, $5 + 3 = 8$ years

The correct answer is C.

Averages

An average is typically the central value of a set of numbers.

For a set of 'n' values $x_1, x_2, \dots, x_n$, the average is given by the following algebraic expression:

$$x_{avg} = \frac{x_1 + x_2 + \dots + x_n}{n}$$

Therefore, the formula for the average of a set of values can be expressed by the following formula:

$$\text{Average} = \frac{\text{Sum of all given values}}{\text{Number of values}}$$

Example 4

The average of five consecutive integers is 20. What is the average of the first 3 of these integers?

- (A) 15
- (B) 17
- (C) 18
- (D) 19

(E) 21

Solution

We know that the average of consecutive integers is always the middle value. So, if the average is 20, the integers are 18, 19, 20, 21, 22.

So, the first 3 integers in this list are 18, 19, 20 whose average will again be the middle value, that is, 19.

The correct answer is D.

Properties of average

- If each number in a set of numbers is increased by 'p', then their average is also increased by 'p'.
- If each number in a set of numbers is decreased by 'p', then their average is also decreased by 'p'.
- Similarly, if each number in a set of numbers is multiplied or divided by 'p', then their average also gets multiplied or divided by the same number 'p'.

Average of two different groups

Let us consider there are two groups; group 1 and group 2 with respective averages 'a' and 'b'. If the number of total items in group 1 and group 2 are 'm' and 'n' respectively, then the combined average of the two groups is given by the following expression:

$$\text{Combined Average} = \frac{ma + nb}{m + n}$$

Change in average on deletion of an item

Let us consider that a value 'x' is deleted from a set of 'n' values with average 'a'. On deletion of an item the average of the remaining values may either increase or decrease which depends

on the value of the deleted item. Therefore, it can be defined under two cases:

Case 1

If the average is increased by μ , then the deleted value 'x' is given by

$$x = a - (n - 1) \mu$$

Example 5

The average of a set of five values is 12. If one number is deleted, the average of the set is increased by 0.6. What is the value of the deleted number?

- (A) 8.2
- (B) 8.8
- (C) 9.2
- (D) 9.6
- (E) 10.2

Solution

Here, the original average (a) = 12

Total number of items (n) = 5

Decrease in the original average (μ) = 0.6

Therefore, the deleted value (x) = $a - (n - 1) \mu = 12 - (5 - 1) 0.6 = 9.6$

The correct answer is D.

Case 2

If the average is decreases by μ , then the deleted value 'x' is given by

$$x = a + (n - 1) \mu$$

Example 6

The average of a set of five values is 12. If one number is deleted, the average of the set is decreased by 0.6. What is the value of the deleted number?

- (A) 14.2
- (B) 14.4
- (C) 16.2
- (D) 19.6
- (E) 20.2

Solution

Here, the original average (a) = 12

Total number of items (n) = 5

Decrease in the original average (μ) = 0.6

Therefore, the deleted value (x) = $a + (n - 1) \mu = 12 + (5 - 1) 0.6 = 14.4$

The correct answer is B.

Change in average on addition of an item

Let us consider that a value 'x' is added to a set of 'n' values with the average 'a'. On addition of an item, the average may either increase or decrease which depends on the value of the added item. Therefore, it can be defined under two cases:

Case 1

If the average is increased by μ , then the added value 'x' is given by

$$x = a + (n + 1) \mu$$

Example 7

The average weight of a class of 13 students is 62.875 kg. When a new student joins the class, the average weight increases to 62.985 kg. What is the weight of the new student?

- (A) 64.415 kg
- (B) 65.825 kg
- (C) 66.545 kg
- (D) 67.215 kg
- (E) 69.615 kg

Solution

Original average (a) = 62.875 kg

Increase in average weight (μ) = $62.985 - 62.875 = 0.11$

Number of students (n) = 13

Therefore, the weight of the new students can be calculated using the formula:

$$x = a + (n + 1) \mu$$

$$x = 62.875 + (13 + 1) 0.11 = 64.415 \text{ kg}$$

The correct answer is A.

Case 2

If the average is decreased by μ , then the added value 'x' is given by

$$x = a - (n + 1) \mu$$

Example 8

Virat Kohli has an average score of 54 in the last 15 matches. After the last match his average becomes 53. What was Virat's score in the last match?

- (A) 30 runs

- (B) 34 runs
- (C) 38 runs
- (D) 42 runs
- (E) 46 runs

Solution

Using the formula discussed above, we get.

Virat's score in the last match = $54 - (15 + 1) \cdot 1 = 38$ runs

The correct answer is C.

5 Time, Work and Partnership

Introduction

Time and work problems are important because there is a certain relationship between the number of persons doing the work, number of days or time taken by them to complete the work and the amount of work that is done.

The problems of time and work can primarily be divided into two types. The first type is the problem where individuals work with different efficiencies either alone or in combination to complete a task. The second type is where group efficiencies are involved. Such types of problems are also known as problems that use the chain rule.

The NMAT by GMAC™ will test you on both of these types of problems.

Problems involving individual efficiencies

In such questions, the rates at which some individuals complete a work alone is given and you are required to calculate the rate at which they can complete the work together (or vice versa). The basic formula for solving such problems is

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$$

where a and b are the time it takes the two individuals to complete a job, while working alone and c is the number of hours it takes them to complete the job working together. Let us look at an illustration to understand this concept better.

Example 1

A can do a work in 20 days. B can do the same work in 30 days. In how many days can A and B do the work together?

- (A) 8 days
- (B) 10 days
- (C) 12 days
- (D) 14 days
- (E) 16 days

Solution

Unitary method: We have been solving such problems using the unitary method.

A can do a work in 20 days. Therefore, in 1 day, A will be able to do $\frac{1}{20}$ of the work.

B can do the same work in 30 days. Therefore, in 1 day, B will be able to do $\frac{1}{30}$ of the work.

Both of them together can do $\left(\frac{1}{20} + \frac{1}{30}\right)$ of the work in 1 day = $\frac{5}{60}$ of the work in 1 day.

Therefore, the entire work will be completed in $\frac{60}{5}$ days, that is, 12 days.

The correct answer is C.

LCM method

An easier method to do such problems is to understand and use a method called the LCM method.

Let the total work be 60 units, where a unit is a simple measurement of work.

Total work = 60 units

A can do 60 units in 20 days, that is, 3 units per day.

B can do 60 units in 30 days, that is, 2 units per day.

Together, they are able to do $3 + 2$, that is, 5 units per day.

Therefore, they will finish the work in $\frac{60}{5}$, that is, 12 days.

With a little practice, the LCM method can be effectively used to solve a problem.



Important Learning: While using the LCM method, it is not necessary to use the LCM of the individual time taken to do the problem. One can take any convenient value and solve the problem.

Problems involving group efficiencies

We will now look at problems where people with the same efficiencies are working in groups. Let us try to understand this with the help of an example.

Example 2

A and B can do a work in 20 and 25 days, respectively. With the help of C and D, they finish the same work in 5 days. If the efficiency of C is half that of A, find the total time taken by D to finish the work alone.

(A) $\frac{100}{17}$

(B) 12

(C) $\frac{200}{17}$

(D) 15

(E) 20

Solution

Let the total work be 100 units.

A: 20 days 5 units/day

B: 25 days 4 units/day

A + B + C + D: 5 days 20 units/day

It means C and D can do 11 units per day. Since the efficiency of C is half of A, C will be able to do 2.5 units per day. It means D would be doing the remaining 8.5 units per day.

Total time taken by D to finish the work alone = $\frac{100}{8.5} = \frac{200}{17}$ days.

The correct answer is C.

Example 3

Three boys can do the same work as one woman. If a work is completed by 36 boys in 28 days working 9 h every day, how many women must be required to complete the same work in 7 days working 6 h every day?

(A) 36 women

(B) 48 women

(C) 54 women

(D) 66 women

(E) 72 women

Solution

Given that 36 boys will be equivalent to 12 women.

$$12 \text{ women} \times 28 \text{ days} \times 9 \text{ h} = y \text{ women} \times 7 \text{ days} \times 6 \text{ h}$$

Therefore, $y = 72$ women

The correct answer is E.

Partnership

Partnership is defined as a legal agreement between two or more persons who agree to share profits or losses incurred by a business entity. Each person in the partnership is called a partner.

If the partnership incurs losses, then partners also share losses; and vice versa.

If IR = Investment Ratio

And, TR = The ratio of time periods of different partners,

Then, Profit Sharing Ratio (PSR) or Loss Sharing Ratio (LSR) is calculated as the product of the IR and TR.

Therefore,

$$\text{PSR or LSR} = \text{IR} \times \text{TR}$$

Important Cases Related to Partnership:

1. If there are two partners who invest I_1 and I_2 for the same period of time, then the PSR or LSR between partners 1 and 2 is calculated as:

$$\frac{\text{Profit (or loss) of Partner 1}}{\text{Profit (or loss) of Partner 2}} = \frac{I_1}{I_2}$$

2. If there are two partners who invest I_1 and I_2 amounts for time periods t_1 and t_2 , then the PSR or LSR of partners 1 and 2 is calculated as:

$$\frac{\text{Profit (or loss) of Partner 1}}{\text{Profit (or loss) of Partner 2}} = \frac{I_1 t_1}{I_2 t_2}$$

3. The share of each partner in a two-person (say Partner 1 and Partner 2) partnership, when they invest I_1 and I_2 amounts for the same duration of time, is calculated as:

$$\text{Partner 1} = \frac{I_1}{I_1 + I_2} \times P \text{ (or L)}$$

$$\text{Partner 2} = \frac{I_2}{I_1 + I_2} \times P \text{ (or L)}$$

4. The share of partners in a three-person (say Partner 1, Partner 2 and Partner 3) partnership, when they invest I_1 , I_2 and I_3 amounts for the same duration of time, is calculated as:

$$\text{Partner 1} = \frac{I_1}{I_1 + I_2 + I_3} \times P \text{ (or L)}$$

$$\text{Partner 2} = \frac{I_2}{I_1 + I_2 + I_3} \times P \text{ (or L)}$$

$$\text{Partner 3} = \frac{I_3}{I_1 + I_2 + I_3} \times P \text{ (or L)}$$

Example 4

A started a business with a capital of Rs. 5,000. Three months later, B joined with a capital of Rs. 7,000. After another 3 months, A invested Rs. 1,000 more while B withdrew Rs. 2,000. Two months later, C joined with a capital of Rs. 5,000. In what ratio should the profits get divided at the end of the year?

- (A) 22:4:17
- (B) 22:17:8
- (C) 22:17:4
- (D) 66:51:20
- (E) 66:17:20

Solution

As per the problem:

Equivalent contribution of A = $5,000 \times 6 + 6,000 \times 6 = 6,6000$

Equivalent contribution of B = $7,000 \times 3 + 5,000 \times 6 = 51,000$

Equivalent contribution of C = $5,000 \times 4 = 20,000$

Therefore, the required ratio = 66:51:20

The correct answer is D.

2.8 Algebra and Probability

2.9 What is Measured?

The algebra and probability section will test you on topics such as equations, inequalities, sequence and series, permutation and combination and probability. You will be required to solve linear equations with one unknown and two unknowns, calculate the roots of a quadratic equation and work with the concept of absolute value.

Algebra is also tested indirectly in word problems as most of these questions will require you to make an equation and solve it.

You will also be tested on the expression of common algebraic identities such as $(a + b)^2$, $(a - b)^2$ and so on.

2.10 Overall Test Taking Strategies

1. As algebra is mostly formula-driven, you should be familiar with all the commonly used formulae.
2. If you make any change to one side of an equation or inequality, remember to make that same change to the other side as well.
3. Remember to reverse the inequality sign when changing a positive number into a negative number or vice versa.
4. A lot of the algebra questions are best tackled through the answer choices. Instead of finding the actual answer, it may be faster to back-solve from the answer choices, especially if you are able to eliminate one or two choices at first glance.

The next few sections will provide you with in-depth strategies for approaching each topic.

1 Equations and Inequalities

Equations

While arithmetic primarily deals with numbers, the basic building block of algebra is a variable which does not have a fixed value.

A variable along with a constant forms the basis of algebra. A variable by itself or a constant by itself or a variable in combination with a constant forms a term in algebra. For example, x^3 will be a term, 8 is also a term, $5x^2$ is also a term and so on.

When many terms combine together, they form an expression. For example, $x^3 - 5x^2 + 11$ is an expression in variable x . Please note that an expression is different from an equation. While an expression does not include the '=' sign, an equation will always include an '=' sign. Moreover, an expression always has a value, while an equation has roots or a solution.

Basis of classification

Algebraic expressions can be classified in the following ways:

- 1. Number of terms:** The first basis of classification of algebraic expressions is based on the number of terms in the expression.
 - An expression having a single term is called a monomial, for example, $5x^2y$. Please note that the number of variables does not make any difference as long as the term is single.
 - An expression having two terms is called a binomial. For example, $3x + 5$.
 - An expression having more than two terms is called a polynomial. For example, $5x + 2y - 6$.
- 2. Degree of the expression:** Before we understand this, we need to understand the definition of degree. Degree is defined as the highest or maximum sum of the powers of all the variables in any term of the expression.

For example,

$$3x^3 + 2x^2yz - 7y^2 + 5yz - 15x + 17$$

- The degree of this expression will be 4 because in the term $2x^2yz$, the power of $x = 2$, power of $y = 1$, power of $z = 1$. Hence the degree will be $2 + 1 + 1 = 4$.
- An expression of degree 1 is called linear.
- An expression of degree 2 is called quadratic.
- An expression of degree 3 is called cubic and so on.



Important Learning:

- $(a + b)^2 = a^2 + 2ab + b^2 = (a - b)^2 + 4ab$
- $(a - b)^2 = a^2 - 2ab + b^2 = (a + b)^2 - 4ab$
- $a^2 - b^2 = (a + b)(a - b)$
- $a^2 + b^2 = \frac{(a + b)^2 + (a - b)^2}{2}$
- $(a + b)^2 - (a - b)^2 = 4ab$
- $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
- $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$
- $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
- $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
- $\frac{(a + b)^2 - (a - b)^2}{4} = ab$
- $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ac)$
- If $a + b + c = 0$ then $a^3 + b^3 + c^3 = 3abc$

Linear equations

As stated earlier, an equation of degree 1 is called a linear equation. In this type of equation, all the variables are raised to the first power only (there are no squares, cubes, etc.). For example,

$$x + 10 = 25$$

In order to solve linear equations, we try to isolate the variable whose value we are trying to find by bringing it on one side of the equation and taking all other values to the other side of the equation. So, in the above equation

$$x + 10 - 10 = 25 - 10$$

$$x = 25 - 10 \text{ (isolating } x \text{ by taking 10 to the other side)}$$

$$x = 15 \text{ (the solution to the equation)}$$

We can always verify whether we have got the correct answer by replacing the value of x (that we have arrived at) in the original equation and checking if it holds true.



Important Learning: To solve a linear equation, you just need to isolate the variable on one side and take all the numbers on the other side. Remember to reverse the signs when changing sides.

Example 1

In colony A, there are 12 houses with an average of 4 members per house, while in colony B, there are 20 houses with an average of Y members per house. If the two colonies together have an average of 3.5 members per house, find Y .

(A) 3.2

(B) 3.6

(C) 4.8

(D) 5.4

(E) 6.2

Solution

It is given that the average number of members in the two colonies together is 3.5. Therefore,

$$12 \times 4 + 20 \times Y = 32 \times 3.5$$

$$48 + 20Y = 112$$

$$20Y = 64$$

$$Y = 3.2 \text{ members per house}$$

The correct answer is A.

Simultaneous equations

In linear equations, we were working with one variable, namely x . In simultaneous equations, we will be working with two variables, namely x and y .

Let us look at this equation

$$3x + 4y = 24$$

From this equation, can you find the values of x and y ? Obviously not!

As a rule, if you want to find the numerical value for N variables, you will need N different equations. In linear equations, we are trying to find the value of one variable, so a single equation is sufficient. However, in the above equation, we are trying to find the values of two variables x and y , so we need two different equations that we will combine and solve simultaneously.

Important Learning: To find the numerical value for N variables,



we need N number of equations.

Let us say we have the following two equations given to us,

$$x + 6y = 9 \quad (1)$$

$$3x + 4y = 24 \quad (2)$$

We can isolate x in Eq. (1) as

$$x = 9 - 6y$$

and we can then substitute this value of x in Eq. (2)

$$3(9 - 6y) + 4y = 24 \quad (3)$$

We can then solve Eq. (3) as a normal linear equation to get the value of y as $\frac{3}{14}$. We can then substitute this value of y in either Eq. (1) or Eq. (2) to find the value of x.

$$\begin{aligned} x + 6 \times \frac{3}{14} &= 9 \\ \Rightarrow x &= \frac{54}{7} \end{aligned}$$

Example 2

The price of two cups, seven pans and four saucers is Rs. 110 while of one cup and two saucers is Rs. 20. Find the price of three pans.

- (A) 30
- (B) 40
- (C) 60
- (D) 70
- (E) 80

Solution

As per the problem:

$$2x + 7y + 4z = 110$$

$$\text{Also, } 2x + 4z = 40$$

Therefore,

$$7y = 70 \text{ or } y = 10$$

Price of three pans will be Rs. 30.

The correct answer is A.

Example 3

Two apples and five bananas cost Rs. 17, while three apples and four bananas cost Rs. 15. What is the price of an apple?

(A) Rs. 1

(B) Rs. 1.50

(C) Rs. 2

(D) Rs. 2.50

(E) Rs. 3

Solution

Let the price of an apple be X.

And, the price of a banana be Y.

Now, as per the question, we have:

$$2X + 5Y = 17 \tag{1}$$

$$\text{And, } 3X + 4Y = 15 \tag{2}$$

Multiply Eq. (1) by 4 and Eq. (2) by 5, we get

$$8X + 20Y = 68$$

$$15X + 20Y = 75$$

Solving, we get $X = \text{Rs. } 1$

The correct answer is A.

Quadratic Equations

An equation of the form $ax^2 + bx + c = 0$, where a , b and c are real and $a \neq 0$, is called a quadratic equation.

How to solve a quadratic equation

The following two methods are used to solve a quadratic equation:

- 1. Method of factorisation:** This is the most popular method of solving a quadratic equation. If $ax^2 + bx + c = 0$ is the equation, we divide b into two parts such that their sum is b and product is ac .

For example, consider the equation $x^2 + 5x + 6 = 0$.

Now, 5 has to be divided into two numbers such that their product = 6 and their sum is 5.

Therefore,

$$\begin{aligned}x^2 + 2x + 3x + 6 &= 0 \\x(x + 2) + 3(x + 2) &= 0 \\(x + 3)(x + 2) &= 0 \\x &= -3, -2\end{aligned}$$

- 2. Shridharacharya's method:** This is the method through which we all learnt the solution of quadratic equations for the first time. If $ax^2 + bx + c = 0$ is the equation, then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where $(b^2 - 4ac)$ is known as D , the discriminant of the equation, which also decides the nature of the roots of the quadratic equation, as follows:

- If $D > 0$, the roots are real and unequal.

- If $D = 0$, the roots are real and equal.
- If $D < 0$, the roots are imaginary.



Important Learning: The solutions to a quadratic equation are technically called its roots.

Properties of quadratic equations

1. If $ax^2 + bx + c = 0$ is the equation and the two roots are α and β , then

$$\alpha + \beta = \text{Sum of the roots} = -\frac{b}{a}$$

$$\alpha\beta = \text{Product of the roots} = \frac{c}{a}$$

2. If we know the roots, we can find the equation using

$$x^2 - (\text{sum of roots})x + \text{product of roots} = 0$$

Example 4

If the sum of the roots of an equation is $\frac{5}{3}$ times the product of the roots, find the relation between b and c .

(A) $b = \frac{5c}{3}$

(B) $b = \frac{3c}{5}$

(C) $b = -\frac{5c}{3}$

(D) $b = -\frac{3c}{5}$

(E) $b = \frac{2c}{5}$

Solution

For a quadratic equation,

Sum of the roots = $-\frac{b}{a}$ and product of the roots = $\frac{c}{a}$.

According to the problem,

$$-\frac{b}{a} = \frac{5}{3} \left(\frac{c}{a} \right)$$

$$-3ab = 5ac$$

$$b = -\frac{5c}{3}$$

The correct answer is C.

Note: The NMAT by GMAC™ will not test any skills beyond quadratic equations.

Inequalities

While equations tell us that two parts of an equation are equal, inequalities tell us that one part is bigger or smaller than the other.

$$2x + 3 < 7$$

Inequalities basically give us an idea of the relative size of two values.

Solution of an inequality

The value(s) of the variable(s) which makes the inequality a true statement is called its **solutions**. The set of all solutions of an inequality is called the **solution set** of the inequality. For example, $x - 1 \geq 0$, has infinite number of solutions as all real values greater than or equal to one make it a true statement. The inequality $x^2 + 1 < 0$ has no solution in R as no real value of x makes it a true statement.

How to solve an inequality

An inequality is solved, in the same way as you solve an equation, by isolating the variable on one side and simplifying it. It is just that

the sign used will not be the '=' sign but the inequality sign, depending on the relation between the two parts of the inequality.

1. $>$ greater than
2. $<$ less than
3. $\geq$ greater than or equal to
4. $\leq$ less than or equal to

So, the solution to the inequality $2x + 3 < 7$ is $x < 2$.

However, there is one major difference between equations and inequalities that needs to be kept in mind—if the inequality is multiplied or divided by a negative number, the sign of the inequality is reversed.

For example, if the inequality $-5x > 3$ is multiplied by -1 , the resulting inequality is

$$5x < -3$$



Important Learning: If an inequality is multiplied or divided by a negative number, the sign of the inequality gets reversed.

Inequality Rules

Rule 1: Equal numbers may be added to (or subtracted from) both sides of an equation.

Rule 2: Both sides of an equation may be multiplied (or divided) by the same non-zero number.

Two Important Results

(a) If $a, b \in \mathbf{R}$ and $b \neq 0$, then

(i) $ab > 0$ or $\frac{a}{b} > 0 \Rightarrow a$ and b are of the same sign

(ii) $ab < 0$ or $\frac{a}{b} < 0 \Rightarrow a$ and b are of the opposite sign

(b) If a is any positive real number, i.e., $a > 0$, then

- (i) $|x| < a \Leftrightarrow -a < x < a$
 $|x| \leq a \Leftrightarrow -a \leq x \leq a$
- (ii) $|x| > a \Leftrightarrow x < -a \text{ or } x > a$
 $|x| \geq a \Leftrightarrow x \leq -a \text{ or } x \geq a$

Example 5

Which of the following describes all possible solutions to the inequality $|a + 4| < 7$?

- (A) $a < 3$
(B) $a > -11$
(C) $3 > a > -11$
(D) $-11 > a > 3$
(E) $a > 11 \text{ or } a < -11$

Solution

Note the absolute value sign in the original inequality. This basically means that the solution could lie on either side of the number line. So, you will have to solve this inequality in two ways to get the entire range of solutions for a .

$$a - 4 < 7 \text{ or } a + 4 > -7$$

$$\text{So, } a < 3 \text{ or } a > -11$$

The correct answer is C.

2 Sequence and Series

Introduction

A series in which a particular relation exists between the terms is called a progression. There are three types of progressions:

Arithmetic Progression (AP), Geometric Progression (GP) and Harmonic Progression (HP).

For the NMAT by GMAC™, you need to focus on AP and GP.

Arithmetic progression

Popularly known as AP, it is a series of terms in which the difference between a term and the next term is constant. This difference is called the common difference of the AP and is denoted by d .

Some examples of AP are

1. 2, 4, 6, 8, 10, 12, 14, ...
2. -3, -6, -9, -12, -15, -18, ...
3. 1, 2, 3, 4, 5, 6, 7, 8, ...
4. $\frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, 3, \frac{7}{2}, 4, \dots$

Properties of AP

The first term is called a , the common difference is called d and the number of terms is denoted by n . Therefore, an AP would be like a , $a + d$, $a + 2d$, $a + 3d$, $a + 4d$ and so on. Some important properties of AP are listed below:

1. The n th term of an AP is given by $T_n = a + (n - 1)d$, a relation between the n th term, the first term, the common difference and the number of terms.
2. If the same quantity (positive or negative) is added to each term of an AP, the series will continue to be an AP.
3. If the same quantity (positive or negative) is multiplied with or divides each term of an AP, the series will continue to be an AP.
4. In an AP, the sum of the terms equidistant from the beginning and end is a constant and is equal to the sum of the first and last terms. Let us try to understand this with the help of an example:

3, 6, 9, 12, 15, 18, 21, 24 is an AP

- Sum of the first and last terms = $3 + 24 = 27$
- Sum of the second and second last terms = $6 + 21 = 27$
- Sum of the third and third last terms = $9 + 18 = 27$
- Sum of the fourth and fourth last terms = $12 + 15 = 27$

What if the number of terms is odd?

Let us try to understand this with the help of another example:

4, 7, 10, 13, 16, 19, 22 is an AP

- Sum of the first and last terms = $4 + 22 = 26$
- Sum of the second and second last terms = $7 + 19 = 26$
- Sum of the third and third last terms = $10 + 16 = 26$
- The middle term in this case, which does not form a pair, will be half the sum of the first and last terms.

5. Sum to n terms of an AP:

$$S_n = \frac{n}{2}(a + l)$$

where l is the last term, in this case the n th term of the AP, and $l = T_n = a + (n - 1)d$

Substituting for l , we get

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

One can use either of the above formulae to find the sum to n terms of an AP.

6. Three consecutive terms in an AP will be $a - d$, a and $a + d$.
7. Four consecutive terms in an AP will be $a - 3d$, $a - d$, $a + d$ and $a + 3d$.
8. Five consecutive terms in an AP will be $a - 2d$, $a - d$, a , $a + d$ and $a + 2d$.

9. Sum of first n natural numbers $\frac{n(n+1)}{2}$.
10. Sum of squares of first n natural numbers $= \frac{n(n+1)(2n+1)}{6}$.
11. Sum of cubes of first n natural numbers $= \left[\frac{n(n+1)}{2} \right]^2$.
12. If a , b and c are in an AP, then b is the arithmetic mean of the three numbers.



Important Learning: In an AP, the sum of the terms equidistant from the beginning and end is a constant and is equal to the sum of the first and the last terms.

Example 1

Which term of the AP series 3, 8, 13, ... is the term 78?

- (A) 14
- (B) 15
- (C) 16
- (D) 17
- (E) 18

Solution

In the given AP

$$a_n = a + (n - 1)d = 78$$

We have $a = 3$, $d = 8 - 3 = 5$. Therefore,

$$3 + (n - 1) \times (5) = 78$$

$$(n - 1) \times 5 = 78 - 3 = 75$$

$$n - 1 = \frac{75}{5} = 15$$

$$n = 15 + 1 = 16$$

The correct answer is C.

Example 2

A man pays a rent of Rs. 50 for the first day, Rs. 100 for the second day and so on, with the rent on each day being Rs. 50 more than the rent on the previous day. What is the total rent paid for the first 10 days?

- (A) 2,750
- (B) 2,800
- (C) 3,050
- (D) 3,100
- (E) 3,350

Solution

The series is an AP with $a = 50$, $d = 50$ and $n = 10$

$$S_n = \frac{10}{2}[2 \times 50 + (10 - 1) \times 50]$$

$$S_n = 5(100 + 450)$$

$$S_n = 5(550)$$

$$S_n = \text{Rs. } 2,750$$

The correct answer is A.

Geometric Progression

GP refers to a series in which the ratio of a term to its previous term is constant. This ratio is called the common ratio of the GP and is denoted by r .

Some examples of GP are

1. 2, 4, 8, 16, 32, 64, ...
2. $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \dots$
3. -2, 4, -8, 16, -32, 64, ...

Properties of GP

The first term is called a , the common ratio is r and the number of terms is denoted by n . Therefore, a GP would be like a, ar, ar^2, ar^3, ar^4 and so on.

Some important properties of a GP are listed below:

1. The n th term of a GP denoted by T_n is given by $T_n = ar^{(n-1)}$.
2. If a constant term (positive or negative) is multiplied with or divides each term of a GP, the series continues to be a GP.
3. Sum to n terms of a GP is given by

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$S_\infty = \frac{a}{1 - r}$$

4. Three consecutive terms in GP will be $\frac{a}{r}, a$ and ar .
5. Four consecutive terms in GP will be $\frac{a}{r^3}, \frac{a}{r}, ar$ and ar^3 .
6. If a, b and c are in GP, then

$$\begin{aligned}\frac{b}{a} &= \frac{c}{b} \\ b^2 &= ac \\ b &= \sqrt{ac}\end{aligned}$$

Then, b is called the geometric mean (GM) of a and c . GM of three numbers a, b and c is the cube root of the product of the three numbers.

Example 3

Find the sum to infinite terms of the series $\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \dots$

- (A) $\frac{1}{2}$
(B) $\frac{1}{3}$

(C) $\frac{1}{4}$

(D) $\frac{1}{6}$

(E) $\frac{1}{8}$

Solution

As per the problem,

$$a = \frac{1}{4} \text{ and } r = \frac{1}{4}$$

$$\text{Sum to infinite terms} = \frac{a}{1-r} = \frac{1/4}{(1-1/4)} = \frac{1}{4} \times \frac{4}{3} = \frac{1}{3}$$

The correct answer is B.

Harmonic Progression

A series of terms is said to be in Harmonic Progression (HP) if the reciprocal of the terms are in AP. As an example, if a, b and c are in HP, then $\frac{1}{a}$, $\frac{1}{b}$ and $\frac{1}{c}$ will be in AP. Therefore,

$$\begin{aligned} \frac{1}{b} - \frac{1}{a} &= \frac{1}{c} - \frac{1}{b} \\ \frac{2}{b} &= \frac{1}{a} + \frac{1}{c} = \frac{a+c}{ac} \\ b &= \frac{2ac}{(a+c)} \end{aligned}$$

where b is called the harmonic mean (HM) of a and c.

Example 4

If the second term of a harmonic progression is 5 and the 5th term of the same harmonic progression is 11, then find the 56th term.

(A) $\frac{12}{99}$

(B) $\frac{13}{99}$

(C) $\frac{37}{99}$

(D) $\frac{41}{99}$

(E) $\frac{55}{99}$

Solution

The reciprocals of the HP form an arithmetic progression $a, a + d, a + 2d, \dots$

Then, $a + d = \frac{1}{5}$ and, $a + 4d = \frac{1}{11}$

Solving above two equations, we get

$$a = \frac{13}{55}, d = \frac{-2}{55}$$

Therefore, 56th term of AP = $a + 55d = \frac{13}{55} + 55 \times \frac{-2}{55} = \frac{99}{55}$

Hence, 56th term of HP = $\frac{55}{99}$

The correct answer is E.

Relationship between the means of AP, GP and HP

If AM, GM and HM be the arithmetic, geometric and harmonic means between a and b , then the following results hold:

$$AM = \frac{a + b}{2} \quad (1)$$

$$GM = \sqrt{ab} \quad (2)$$

$$HM = \frac{2ab}{a + b} \quad (3)$$

Therefore, we can write:

$$AM \times HM = \frac{a + b}{2} \cdot \frac{2ab}{a + b} = ab = GM^2$$

$$GM^2 = AM \times HM \quad (4)$$

Or

Also, we have

$$\begin{aligned} \text{AM} - \text{GM} &= \frac{a+b}{2} - \sqrt{ab} = \frac{a+b+2\sqrt{ab}}{2} \\ &= \left(\frac{\sqrt{a} - \sqrt{b}}{\sqrt{2}} \right)^2 \end{aligned} \quad (5)$$

which is positive if a and b are positive; therefore, the AM of any two positive quantities is greater than their GM.

Also, from Eq. (4) we have,

$$\text{GM}^2 = \text{AM} \times \text{HM}$$

Clearly then, GM is a value that would fall between AM and HM and from Eq. (5) it is known that $\text{AM} > \text{GM}$, therefore we can conclude that $\text{GM} > \text{HM}$. In other words, we can say that the arithmetic, geometric and harmonic means between any two +ve quantities are in descending order of magnitude.

Sum to n Terms of Special Series

1. Sum of the first n natural numbers:

$$\sum_{n=1}^n n = 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$

2. Sum of the squares of first n natural numbers.

$$\sum_{n=1}^n n^2 = 1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

3. Sum of cubes of first n natural numbers:

$$\sum_{n=1}^n n^3 = 1^3 + 2^3 + 3^3 + \dots + n^3 = \left[\frac{n(n+1)}{2} \right]^2$$

Example 5

Evaluate: $6^2 + 7^2 + 8^2 + 9^2 + 10^2 + 11^2$

(A) 449

(B) 450

(C) 451

(D) 452

(E) 453

Solution

Required Sum = $(1^2 + 2^2 + 3^2 + \dots + 11^2) - (1^2 + 2^2 + 3^2 + \dots + 5^2)$

$$S = \frac{11(11+1)(2 \times 11+1)}{6} - \frac{5(5+1)(2 \times 5+1)}{6}$$

$$S = \frac{11 \times 12 \times 23}{6} - \frac{5 \times 6 \times 11}{6} = 451$$

The correct answer is C.

3 Permutation and Combination

Introduction

Permutation and combination are two of the most logical topics in mathematics, and their applications can be observed and verified in real-life situations.

Fundamental principle of counting

The concepts in permutation and combination are based on the fundamental principle of counting, which in turn comprises the rule of multiplication and the rule of addition. These are listed as follows:

1. **Rule of multiplication:** If a certain task can be done in m ways and after having done it, another can be done in n ways, then

the total number of ways in which the two tasks can be done together is $m \times n$.

Thus, if there are three ways of going from A to B and four ways of going from B to C, then the number of ways of going to C from A via B = $3 \times 4 = 12$ ways.

- 2. Rule of addition:** If a certain task can be done in m ways and another can be done in n ways, then either of the two tasks can be done in $m + n$ ways.

Thus, when tasks A and B both have to be completed, we multiply, but when either A or B has to be completed, we add.



Important Learning: Whenever the concept in the question is the same as 'and' we will use multiplication and whenever the concept is same as 'or' we will use addition.

Permutation

While a combination deals only with selection, permutation is selection and arrangement both, that is, in permutation, we are not only interested in selecting the things, but we also take into consideration the number of possible arrangements of the selected things.

The permutation of n different things taken r at a time is

$${}^n P_r = \frac{n!}{(n-r)!}$$

The concept of permutation is illustrated in the following example.

Example 1

Suppose there are four children in a group. Find the number of ways in which any two children out of the four can be arranged for a photograph.

(A) 8 ways

- (B) 10 ways
- (C) 12 ways
- (D) 14 ways
- (E) 16 ways

Solution

We need to select two children out of the four, and then arrange them. So, we need to take the permutation of four different things, taken two at a time.

$${}^4P_2 = \frac{4!}{(4-2)!} = \frac{24}{2} = 12 \text{ ways}$$

The correct answer is C.

Permutation of N different things taken all at a time

The permutation of n different things taken all at a time is

$${}^nP_n = \frac{n!}{(n-n)!} = \frac{n!}{0!} = n!$$

This is the result of selecting n things out of n given things, and then arranging them. But, if n things are being selected out of n things, then selection will be possible in only one way and so the result obtained, that is, n! is entirely due to the arrangement of the selected things.

This leads to a very important result of permutation, that is, *n different things can be arranged in a straight line in n! ways.*

For example, if four students are to be arranged in a straight line for a photograph, the total number of ways of doing so is $4! = 4 \times 3 \times 2 \times 1 = 24$ ways.

Permutation of identical things

This refers to the number of permutations of n things taken all at a time. Here, p things are alike of one kind, q of second kind, r of third kind and so on. The permutation is given by

$$\frac{n!}{p! \times q! \times r!}$$

that is, divide by the factorial of the number of identical things. The concept is illustrated by means of the following example.

Example 2

In how many different ways can the letters of the word **ARRANGE** be arranged?

- (A) 1200 ways
- (B) 1240 ways
- (C) 1260 ways
- (D) 1300 ways
- (E) 1340 ways

Solution

$$\text{Total number of ways} = \frac{7!}{2! \times 2!} = 1,260 \text{ ways}$$

The correct answer is C.

Circular permutation

The total number of ways in which n different things can be arranged in a circle = $(n - 1)!$ ways.

For example, if three people are to be seated on a circular table for dinner, the number of ways of doing so is $(3 - 1)! = 2$ ways.



Important Learning: If there are n different things, they can be arranged in a circle in $(n - 1)!$ different ways.

Distribution

Case 1

Different things to be distributed to different groups.

Example 3

In how many ways can five different balls be distributed in three different boxes?

- (A) 143 ways
- (B) 243 ways
- (C) 343 ways
- (D) 443 ways
- (E) 543 ways

Solution

The first ball can go into any of the three boxes, and therefore, the first ball can be distributed in three ways. Having done this, the second ball can be distributed in three ways and so on.

Therefore, the five balls can be distributed in $3 \times 3 \times 3 \times 3 \times 3 = 3^5$ ways or 243 ways.

The correct answer is B.

Case 2

Identical things to be distributed to different groups.

Example 4

In how many ways can five identical balls be distributed in three different boxes?

- (A) 15 ways

(B) 18 ways

(C) 20 ways

(D) 21 ways

(E) 24 ways

Solution

Five identical balls have to be distributed in three different boxes. If space has to be divided into three boxes, we can do so by using two partitions.

Now, one of the possible arrangements will be $\frac{bbb}{\frac{bb}{0}}$, that is, three balls in the first box, two balls in the second box and no balls in the third box.

Other possible arrangements can be:

1. $\frac{bb}{\frac{bbb}{0}}$
2. $\frac{b}{\frac{bbb}{b}}$
3. $\frac{b}{\frac{bb}{\frac{bb}{b}}}$
4. $\frac{b}{\frac{b}{\frac{bbb}{bbb}}}$ and so on

If you observe closely, we are arranging and rearranging seven things in a straight line, out of which five (balls) are identical of one type and two (partitions) are identical of another type.

Thus, required number of ways = $\frac{7!}{5! \times 2!} = 21$ ways

The correct answer is D.

Example 5

In how many different ways can 10 students of a class with roll numbers from 1 to 10 be seated in a straight line such that one of the extreme positions has a student with an odd roll number while the other extreme position has a student with an even roll number?

- (A) $48 \times 6!$
- (B) $44 \times 12!$
- (C) $50 \times 8!$
- (D) $50 \times 6!$
- (E) $52 \times 8!$

Solution

Let the first place have an odd number. This place can be filled in five ways (1, 3, 5, 7 and 9).

The other extreme position can be also filled in five ways (2, 4, 6, 8 and 10).

These two extreme positions can be interchanged also. Therefore, the two extreme positions can be first filled in

$$5 \text{ ways} \times 5 \text{ ways} \times 2 \text{ ways} = 50 \text{ ways}$$

Now, the remaining eight people can occupy eight available positions in $8!$ ways.

$$\text{Total ways} = 50 \times 8! \text{ ways}$$

The correct answer is C.

Example 6

Eight students were to be seated along two rows such that four students will be seated in each of the two rows called A and B. Two of the eight students definitely want to be seated in row A while one of them definitely wants to be seated in row B. In how many different ways can the eight students be seated?

- (A) 5,760
- (B) 5,960
- (C) 6,500
- (D) 6,760
- (E) 7,160

Solution

The two students who want to be in row A can be seated in $4 \times 3 = 12$ ways

The student who wants to be in row B can be seated in four ways

The remaining five people can be seated in $5!$ ways = 120 ways

Therefore, total number of ways = $12 \times 4 \times 120 = 5,760$ ways

The correct answer is A.

Combination

Combination means selection only, that is, in combination, we are only interested in the selection of things and not in their arrangement.

In general, the number of combinations of n different things taken r at a time is given by ${}^nC_r$, where

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

where $n!$ (read as n factorial) = $n \times (n - 1) \times (n - 2) \times \dots \times 4 \times 3 \times 2 \times 1$

Thus,

$$0! = 1 \text{ (by definition)}$$

$$1! = 1$$

$$2! = 2 \times 1$$

$$3! = 3 \times 2 \times 1 \text{ and so on}$$

Let us try to understand the concept of combination by taking an example.

Example 7

There are four fruits, an apple, a mango, a banana and an orange, and we need to select any two fruits out of these four fruits. In how many ways can we do this?

- (A) 4 ways
- (B) 5 ways
- (C) 6 ways
- (D) 7 ways
- (E) 8 ways

Solution

Number of ways of selecting two fruits from four fruits is ${}^4C_2$, that is,

$$\frac{4!}{2! \times (4-2)!} = \frac{24}{4} = 6$$

that is, six different ways, which will be AM, AB, AO, MB, MO and BO.

The correct answer is C.

Rules of combination

1. ${}^nC_0 = 1$ way (there is only one way to select 0 things out of n different things).

2. ${}^nC_n = 1$ way (there is only one way to select n things out of n different things).
3. ${}^nC_1 = n$ ways (there are n ways to select one thing out of n different things).
4. ${}^nC_r = {}^nC_{n-r}$ (the number of ways of selecting r things out of n different things is the same as identifying those $(n - r)$ things that will not be selected).

Combination of N different things taken 0 or some or all at a time

The number of combinations of n different things taken 0 or some or all at a time is:

$${}^nC_0 + {}^nC_1 + {}^nC_2 + {}^nC_3 + \dots + {}^nC_n$$

The above expression is the binomial expansion of $(1 + 1)^n = 2^n$

Therefore,

$${}^nC_0 + {}^nC_1 + {}^nC_2 + {}^nC_3 + \dots + {}^nC_n = 2^n$$

Example 8

Eleven players are to be selected for a match out of an available list of 14 players. In how many ways can this be done such that the best two identified players are always selected?

- (A) ${}^{14}C_{11}$
- (B) ${}^{12}P_9$
- (C) ${}^{12}C_9$
- (D) ${}^{12}C_9 \times 2!$
- (E) ${}^{12}C_{11}$

Solution

If two people have to be definitely selected, then nine people have to be selected of the remaining 12 people = $^{12}C_9$.

The correct answer is C.

4 Probability

Introduction

Probability is defined as the chance of happening of an event and is a measure of the likelihood that an event will occur. It is used to quantify an attitude of mind towards some proposition of whose truth we are not certain. The certainty we adopt can be described in terms of a numerical measure and this number, between 0 and 1 (where 0 indicates impossibility and 1 indicates certainty), is called probability.

Thus, the higher the probability of an event, the more certain we are that the event will occur. A simple example would be the toss of a fair coin. As the two outcomes are deemed equiprobable, the probability of 'heads' equals the probability of 'tails', and each probability is $\frac{1}{2}$ or equivalently a 50% chance of either 'heads' or 'tails'.

In many ways, the concept of probability can be said to be an extension of the concepts of permutation and combination.

In examples and problems where the event is described, the basis of solving the problem happens to be the **classical definition of probability**, which says

$$\text{Probability of an event E, denoted by } P(E) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

where the favourable number of outcomes or cases is as defined in the problem under the given set of conditions and the total number

of outcomes or cases is the number of ways of doing the task without any condition being applicable.

Example 1

What is the probability that the month of May will have five Tuesdays?

- (A) $\frac{2}{3}$
- (B) $\frac{2}{5}$
- (C) $\frac{3}{5}$
- (D) $\frac{3}{7}$
- (E) $\frac{3}{8}$

Solution

The month of May will have 31 days which would get converted into 28 days (4 weeks) and 3 odd days.

Therefore, each of the 7 days will definitely appear 4 times. The remaining 3 days can be

1. Mon, Tue, Wed
2. Tue, Wed, Thu
3. Wed, Thu, Fri
4. Thu, Fri, Sat
5. Fri, Sat, Sun
6. Sat, Sun, Mon
7. Sun, Mon, Tue

Total number of cases = 7.

Number of favourable cases = 3 (There are the three cases in which Tuesday appears.)

Required probability = $\frac{3}{7}$.

The correct answer is D.

Elements of probability

1. **Scope:** Probability is always defined for the future.
2. **Random experiment:** A random experiment is an experiment, trial or observation that can be repeated numerous times under the same conditions. The outcome of an individual random experiment must be independent and identically distributed. It must in no way be affected by any previous outcome and cannot be predicted with certainty.
3. **Sample space:** The total number of ways in which an event can happen is called the sample space of the event.

• Sample space for toss of coins:

- (A) Tossing a coin: two elements (H or T)
- (b) Tossing two coins: two elements $\times$ two elements = four elements (HT, TH, TT, HH)
- (d) Tossing three coins: two elements $\times$ two elements $\times$ two elements = eight elements

(HHH, HHT, HTH, THH, TTT, TTH, THT, HTT)

• Sample space for throwing one or more dice:

- (A) Throw a dice: six elements (1, 2, 3, 4, 5, 6)
- (b) Throw two dice: 36 elements [(1, 1), (1, 2), (1, 3)...(1, 6), (2, 1), (2, 2)...(2, 6) and so on till (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)]

- 4. Range of probability of any event:** As the number of favourable outcomes cannot be greater than the total number of outcomes, therefore $0 \leq P(E) \leq 1$, that is, probability of any event will always lie between 0 and 1.



Important Learning: The range of probability of any event will always lie between 0 and 1, both inclusive.

- 5. Any event will either happen or not happen:** $P(E) + P(\sim E) = 1$, that is, sum of the probability of happening of an event and the probability of its not happening = 1.
- 6. Odds for and against an event:** It is not necessary that a problem will always provide probabilities. There are examples where odds in favour of an event or odds against an event are provided.

$$\text{Odds in favour of an event} = \frac{\text{Number of favourable outcomes}}{\text{Number of unfavourable outcomes}}$$

$$\text{Odds against an event} = \frac{\text{Number of unfavourable outcomes}}{\text{Number of favourable outcomes}}$$

- 7. Mutually exclusive events:** Any two events are said to be mutually exclusive events if they cannot occur together.

For two mutually exclusive events A and B

$$P(A \text{ or } B) = P(A) + P(B)$$

and if the events are not mutually exclusive, then

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

In these expressions, $P(A \text{ or } B)$ represents the probability of either event A happening or event B happening.

- 8. Independent events:** Any two events where the probability of happening of one event is not dependent on the other are said

to be independent events.

For two independent events A and B,

$$P(A \text{ and } B) = P(A) \times P(B)$$

The above result will be true for any number of independent events.

For three independent events A, B and C

$$P(A, B \text{ and } C) = P(A) \times P(B) \times P(C)$$

9. Pack of cards: Problems related to a pack of cards are frequently asked as a part of questions on probability. In case of a pack of cards, remember the following:

- A pack has 52 cards (26 black and 26 red), which get divided into 13 cards each of four different types or variety.
- These 13 cards are (Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q and K) and the four types are Hearts, Diamond, Spade and Club. Technically, these four types are called **suits**. So, in a normal pack of cards, there will be four aces, four ones, four twos and so on, thus, making a total of 52 cards.
- King, Queen and Jack are also popularly known as face cards. A pack of cards will, therefore, have 12 face cards.

Example 2

What is the probability that a card drawn at random from a pack of cards is either black or a jack?

- (A) $\frac{17}{52}$
- (B) $\frac{7}{13}$
- (C) $\frac{27}{52}$
- (D) $\frac{3}{13}$

(E) $\frac{5}{9}$

Solution

There are a total of $(13 + 13) = 26$ black cards and 4 jacks in a pack of cards. But remember that two of these jacks are also black cards, so we will have to account for this overlap.

Therefore, number of favourable cards $= 13 + 13 + 4 - 2 = 28$.

Total cards $= 52$.

Required probability $= \frac{28}{52} = \frac{7}{13}$.

The correct answer is B.

10. AND rule: Suppose the probability of event A is $P(A)$ and that of event B is $P(B)$. Now, if these two events are to occur together, i.e. if we want to calculate the probability of occurrence of event A and that of event B, we need to multiply the individual probabilities of A and B.

Therefore, the probability of occurrence of A and B will be $P(A) \times P(B)$.

11. OR rule: When the probabilities of two events are given and we need to calculate the probability that at least one of them occurs, we need to add the individual probabilities of the two events. Therefore, if the probability of event A is $P(A)$ and that of event B is $P(B)$, then the probability that at least one of the two events occurs is $P(A) + P(B) - P(A \text{ and } B)$.

12. Conditional Probability: When A and B are dependent events, then $P(A/B)$ denotes probability of happening of event A when B has already occurred. Similarly, $P(B/A)$ denotes probability of happening of B when A has already occurred.

Example 3

Two students are selected from a class of 5 girls and 12 boys. Find the probability that a particular pair of girl and boy is selected.

(A) $\frac{1}{136}$

(B) $\frac{1}{63}$

(C) $\frac{1}{51}$

(D) $\frac{10}{21}$

(E) $\frac{13}{61}$

Solution

$$\text{Total number of possibilities} = {}^{17}C_2 = \frac{17 \times 16}{1 \times 2} = 17 \times 8 = 136$$

$$\text{Number of favourable cases} = 1$$

$$\text{Therefore, the required probability} = \frac{1}{136}.$$

The correct answer is A.

Example 4

A bag contains five red and nine black balls, while another has three red and five black balls. A ball is first selected at random from bag 1 and transferred to bag 2, and then a ball is drawn from bag 2. What is the probability that the ball drawn is red?

(A) $\frac{25}{103}$

(B) $\frac{47}{126}$

(C) $\frac{33}{97}$

(D) $\frac{47}{97}$

(E) $\frac{61}{131}$

Solution

We need to consider both the cases here.

Red ball is transferred, and then red ball is drawn.

Black ball is transferred, and then red ball is drawn.

$$= \frac{5}{14} \times \frac{4}{9} + \frac{9}{14} \times \frac{3}{9} = \frac{20}{126} + \frac{27}{126} = \frac{47}{126}$$

The correct answer is B.

Example 5

Three cards are drawn from a pack of cards at random. Find the probability that they consist of both colours.

(A) $\frac{{}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$

(B) $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$

(C) $\frac{{}^{26}C_3}{{}^{52}C_3}$

(D) $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$

(E) None of these

Solution

Number of favourable cases = 2 red and 1 black or 1 red and 2 black

$$= {}^{26}C_2 \times {}^{26}C_1 + {}^{26}C_1 \times {}^{26}C_2 = 2 \times {}^{26}C_2 \times {}^{26}C_1$$

Total cases = ${}^{52}C_3$

$$\text{Therefore, required probability} = \frac{2 \times {}^{26}C_2 \times {}^{26}C_1}{{}^{52}C_3}$$

The correct answer is B.

Bayes' Theorem

Bayes' theorem is a direct application of conditional probabilities. This theorem is used to find the conditional probability of an event $P(A/B)$, say, when the "reverse" conditional probability $P(B/A)$ is known.

Let $A_1, A_2, \dots, A_n$ be a set of mutually exclusive events that together form the sample space S . Let B be any event from the same sample space, such that $P(B) > 0$. Then,

$$P(A_k / B) = \frac{P(A_k \cap B)}{P(A_1)P(B/A_1) + P(A_2)P(B/A_2) + \dots + P(A_n)P(B/A_n)}$$

We know that $P(A_k \cap B) = P(A_k)P(B/A_k)$, so, Baye's theorem can also be expressed as

$$P(A_k / B) = \frac{P(A_k)P(B/A_k)}{P(A_1)P(B/A_1) + P(A_2)P(B/A_2) + \dots + P(A_n)P(B/A_n)}$$

Example 6

Three companies P, Q and R supply 20%, 30% and 50% of the books to a college. Past experience shows that 2%, 4% and 5% of the books produced by these companies are defective. If a book was found to be defective, what is the probability that the book was supplied by company Q?

- (A) $\frac{8}{77}$
- (B) $\frac{10}{77}$
- (C) $\frac{12}{77}$
- (D) $\frac{17}{77}$
- (E) $\frac{19}{77}$

Solution

Let us consider that P, Q and R be the events that books are supplied by companies P, Q and R respectively.

Suppose D be the event that books are defective.

According to the question,

$$P(P) = 0.2, P(Q) = 0.3 \text{ and } P(R) = 0.5$$

$$\text{Also, } P(D/P) = 0.02, P(D/Q) = 0.04, P(D/R) = 0.05$$

$$\begin{aligned}\text{Required probability, } P(Q / D) &= \frac{P(Q)P(D / Q)}{P(P)P(D / P) + P(Q)P(D / Q) + P(R)P(D / R)} \\ &= \frac{0.3 \times 0.04}{0.2 \times 0.02 + 0.3 \times 0.04 + 0.5 \times 0.05} \\ &= \frac{0.012}{0.04 + 0.012 + 0.025} = \frac{0.012}{0.077} = \frac{12}{77}\end{aligned}$$

The correct answer is C.

2.11 DI-Caselets and Tables

2.12 What is Measured?

The DI-Caselets and Tables section consists of caselets and tables that you will need to analyse and apply while answering the questions.

Your mental math skills get tested indirectly as you will need to make a lot of quick calculations especially using concepts of percentages, ratios, etc.

Your estimation skills also get tested as, in a lot of the questions, you will be able to arrive at the answer just by intelligent estimation and elimination of wrong answer choices.

2.13 Overall Test Taking Strategies

1. Scan the data once quickly but do not pay too much attention to every small detail as you can always do so later, based on the questions that you get.
2. The figures are all drawn to scale so you can estimate the answer, especially if the answer choices are very far apart.
3. Do not confuse percentages with actual numbers.

The next few pages will provide you with in-depth strategies for approaching this topic.

Introduction

Data Interpretation is an important area in testing the aptitude of a candidate. The primary objective in Data Interpretation (henceforth referred to as DI) is to:

1. Assess the capability of data assimilation, that is, to understand a data in its given form.
2. Carry out calculations based on the given data.
3. Take effective business decisions based on the calculations.

The data could be in the form of a caselet, bar graph, line graph, pie chart, histogram, frequency polygon, etc.

Concepts in data interpretation

Growth and growth rate

Growth in essence is the change in the value of a variable from one point in time to another point in time. Although it is generally associated with an increase in the value of a variable, mathematically, the value of growth can be negative.

Since, growth and growth rate are associated also with the change in a variable with respect to time, both of them are usually calculated on the immediate previous value until and unless mentioned otherwise. While growth is the change in the absolute value of a variable, growth rate is the percentage change in the value of a variable. In order to understand the concept of growth and growth rate, let us look at an example:

Example 1

The following table gives the value of the total sales of AR Associates across four years. The sales value is in Rs. ('000).

Year	2012	2013	2014	2015
Sale	150	200	240	300

- (A) Find the growth in the sales of AR Associates in the year 2014.

- (B) Find the growth rate of sales of AR Associates in the year 2015.
- (C) Find the growth rate of sales of AR Associates in the period 2012–2015.
- (D) Find the growth rate of sales of AR Associates in the year 2012.
- (E) If the growth rate of sales of AR Associates in the year 2012 is 25%, find the value of the sales of AR Associates in the year 2011.

Solution

- (A) The growth in the sales of AR Associates in the year 2014

$$2,40,000 - 2,00,000 = \text{Rs. } 40,000$$

- (B) Growth rate of sales in the year 2015

$$\frac{(3,00,000 - 2,40,000)}{2,40,000} \times 100 = \frac{6}{24} \times 100 = 25\%$$

- (C) Growth rate of sales in the period 2012–2015

$$\frac{(3,00,000 - 1,50,000)}{1,50,000} \times 100 = 100\%$$

- (D) If we want to find out the growth rate of sales in the year 2012, we need to find the value of sales in the immediately preceding year, that is, 2011.

Since this data is not provided, the answer to the question cannot be determined.

- (E) Let y be the sales of AR Associates in the year 2011. Therefore,

$$y \times \frac{125}{100} = 1,50,000$$

$$y \times \frac{5}{44} = 1,50,000$$

$$y = \text{Rs. } 1,20,000$$

Percentage change in growth rate

Many of us do not differentiate between the calculation of percentage change in growth and growth rate. Actually, these are two different concepts.

Percentage change in growth rate gives the percentage change between two values that are expressed in percentage terms, that is, percentage change in growth rate gives the percentage change in two values that are growth rates.

To understand the concept better, consider Example 1 again.

Example 2

Find the percentage change in the growth rate of AR associates in the year 2014.

- (A) Decrease of 20%
- (B) Increase of 20%
- (C) Decrease of 40%
- (D) Increase of 40%
- (E) Increase of 50%

Solution

In order to answer this question, we would need the value of the growth rate of sales of AR Associates in the year 2013 and the year 2014.

Growth rate of sales of AR Associates in the year 2013

$$\frac{(2,00,000 - 1,50,000)}{1,50,000} \times 100 = \frac{100}{3} = 33.33\%$$

Growth rate of sales of AR Associates in the year 2014

$$\frac{(2,40,000 - 2,00,000)}{2,00,000} \times 100 = \frac{100}{5} = 20\%$$

Therefore, percentage change in growth rate

$$\frac{(20 - 33.33)}{33.33} \times 100 = -40\%$$

That is, a decrease of 40%.

The correct answer is C.

Percentage points

Percentage point is the difference between two values that are expressed in percentage terms. Consider the following example.

Example 3

A girl got 55% marks in the fifth semester and 57.5% marks in the sixth semester. By how many percentage points are the marks in the sixth semester more than the marks obtained in the fifth semester?

- (A) 1.5 percentage points.
- (B) 2.5 percentage points.
- (C) 3.5 percentage points.
- (D) 4.5 percentage points.
- (E) 5.5 percentage points.

Solution

Required value = 57.5% – 55% = 2.5 percentage points.

The correct answer is B.

Market share

Market share is the total percentage of the market serviced by a company, product or brand. Market share can be calculated either on volume basis (number of units sold) or value basis (revenue or sales or turnover). Also average product price is equal to the total market value divided by the total market volume. Consider the following example.

Example 4

In a market there are three products being sold. The price along with the total sale in units is given for each of the three products.

Product	Price/Unit	Sale in Numbers	Sale in Rs.
P	Rs. 5	10,000	50,000
Q	Rs. 4	15,000	60,000
R	Rs. 4.5	20,000	90,000

- (A) Find the market share of product P on volume basis.
- (B) Find the market share of product Q on value basis.
- (C) Find the average market price.

Solution

- (A) Total market volume = 45,000 units.

Total sale of product P = 10,000 units.

$$\text{Market share of P on volume basis} = \frac{10,000}{45,000} \times 100 = \frac{200}{9} = 22.22\%$$

- (B) Total market value = Rs. 50,000 + Rs. 60,000 + Rs. 90,000 = Rs. 20,000

Sales of product Q = Rs. 60,000

$$\text{Market share of product Q on value basis} = \frac{60,000}{2,00,000} \times 100 = 30\%$$

(C) Average market price is given by

$$\frac{\text{Total market value}}{\text{Total market volume}} = \frac{2,00,000}{45,000} = \frac{200}{45} = \frac{40}{9} = \text{Rs. } 4.44/\text{unit}$$

1 DI-Caselets

A DI-Caselet is a set of information that is given in the paragraph form. In a caselet, no graphs or tables is given. You need to read the given information and organise the given data in tabular or pictorial form to solve the questions.

Data for Examples 1–3: A person was looking at the performance data of four companies namely A, B, C and D for the year 2014. He observed that the sale of company A for the year 2014 was twice the expenses for company D in the same year. The profit for company C in the year 2014 was 25% while its sale was Rs. 300 crore. The ratio of the sales of company B and the expenses of company D was 4:5. Also, the expenses of company B were half of the total expenses of company D in the same year.

It was also observed that the sale of company D was Rs. 250 crore while its profit for the year was Rs. 150 crore. Also, the expenses of company A in the year 2014 were such that its profit was 50%.

(For the questions based on above data, consider, Profit = Sale - Expenses)

Example 1

What is the profit percentage of company B in the year 2014?

- (A) 35%
- (B) 40%
- (C) 50%

(D) 55%

(E) 60%

Example 2

Find the value of profit of company A in the year 2014.

(A) Rs. 33.33 crore

(B) Rs. 45 crore

(C) Rs. 50 crore

(D) Rs. 55 crore

(E) Rs. 66.66 crore

Example 3

Which company had the highest profit percentage in the year 2014?

(A) A

(B) B

(C) C

(D) D

(E) Both A and D

General Explanation for Examples 1–3:

For company C:

Sales of company C = Rs. 300 crore and profit = 25%.

Therefore, Expenses $\times \left(\frac{125}{100}\right) = 300$

Expenses = Rs. 240 crore.

For company D:

Sales = Rs. 250 crore

Profit = Rs. 150 crore

Expenses = 250 – 150 = Rs. 100 crore.

For company A:

Sales of company A in 2014 = $2 \times 100 = \text{Rs. } 200$ crore.

Profit of company A = 50%

Therefore, Expenses $\times \left(\frac{150}{100} \right) = 200$

Expenses = $\text{Rs. } \frac{400}{3} = \text{Rs. } 133.33$ crore.

For company B:

Ratio of the sales of company B to the expenses of company D = 4:5

Therefore, sales of company $\frac{B}{100} = \frac{4}{5}$

Sales of company B in 2014 = Rs. 80 crore

Expenses of company B in 2014 = Rs. 50 crore

Therefore, profit of company B in 2014 = Rs. 30 crore

Thus overall performance of companies can be tabulated as:

Company	Sales (in crore)	Expenses (in crore)	Profit (in crore)	Profit (%)
A	200	133.33	66.66	50
B	80	50	30	60
C	300	240	60	25
D	250	100	150	150

Now, all the questions can be solved easily:

1. (E)
2. (E)
3. (D)

2 DI-Tables

A DI-Table is a set of data arranged in rows and columns. It is one of the most common ways of putting information across to people. A table consists of several boxes with information inside. The first row and the first column are generally used to denote the titles.

Data for Examples 1–3: The following table gives the sales of four companies in lakhs across four years from 2004 to 2007. Read the data carefully and answer the questions that follow.

Company	2004	2005	2006	2007
A	120	130	145	160
B	150	166	160	190
C	170	185	190	200
D	110	125	140	150

Example 1

By what percentage are the sales of company B in the year 2005 more than that of company A in the year 2004?

- (A) 20%
- (B) 33.33%
- (C) 38.33%
- (D) 40%
- (E) 46%

Solution

Required value

$$\left[\frac{166 - 120}{120} \right] \times 100 = 46 \times \frac{5}{6} = \frac{230}{6} = 38.33\%$$

The correct answer is C.

Example 2

By how much value is the average sale of company C more than the average sale of company D during the period?

- (A) 35 lakhs
- (B) 38 lakhs
- (C) 45 lakhs
- (D) 55 lakhs
- (E) None of these

Solution

Average sales of company C is

$$170 + 185 + 190 + 200 = \frac{745}{4}$$

$$\text{Average sales of company D is } 110 + 125 + 140 + 150 = \frac{525}{4}$$

$$\text{Difference} = \frac{745}{4} - \frac{525}{4} = \frac{220}{4} = 55 \text{ lakh}$$

The correct answer is D.

Example 3

If the four companies account for a 40% market share by value in 2007, what was the total sale of the market?

- (A) 14 crore
- (B) 16 crore
- (C) 17.5 crore
- (D) 18 crore
- (E) 20 crore

Solution

Total sales of the four companies in 2007 = 160 + 190 + 200 + 150 = Rs. 700 lakh

This is 40% of the total sales. Therefore,

Total sales = 700×2.5 lakh = Rs. 17.5 crores

The correct answer is C.

Data for Examples 4–6: Two thousand students applied for admission to various programmes at AU University. Out of the total applicants, 20% did not take the admission test. The following table gives the cumulative frequency in percentage of the mark range received by those students who appeared for the admission test.

Marks	Cumulative Frequency (%)
≤ 10 marks	15
≤ 20 marks	25
≤ 30 marks	40
≤ 40 marks	60
≤ 50 marks	85
≤ 60 marks	100

Example 4

What is the number of students who received marks in the range of 21–30 in the admission test?

- (A) 240
- (B) 400
- (C) 500
- (D) 640
- (E) None of these

Solution

As per the problem, 2,000 students applied out of which 20% did not appear for the test.

Number of students who appeared = 80% of 2,000 = 1,600

Percentage of students in the range of 21–30 marks = $40 - 25 = 15\%$

Therefore, 15% of 1,600 = 240 students

The correct answer is A.

Example 5

If more than 40 marks are required to qualify for the next round, find the difference between the number of students who qualified for the next round and those who failed to qualify for the next round.

(A) 160

(B) 240

(C) 320

(D) 380

(E) 420

Solution

Percentage of students who qualified for the next round = 40%

Percentage of students who did not qualify for the next round = 60%

Difference between the two = 20% of 1600 = 320 students

The correct answer is C.

Example 6

By what percentage is the number of students in the range of 41–50 marks more than those in the range of 0–10 marks?

- (A) 10%
- (B) 20%
- (C) 33.33%
- (D) 55.55%
- (E) 66.66%

Solution

Percentage of students in the range of 41–50 marks = 25%

Percentage of students in the range of 0–10 marks = 15%

Therefore,

$$\left(\frac{25-15}{15} \right) \times 100 = 66.66\%$$

The correct answer is E.



Important Learning: The knowledge of fractional equivalents of various percentages, such as 12.5% is the same as $\frac{1}{8}$, will be very important while attempting data interpretation questions.

Data for Examples 7–9: Go through the following information and solve the questions based on them.

Current structure	
Equity	28%
Debt	22%
Cash	4%
Real Estate	46%

Proposed structure	
Equity	70%
Debt	25%
Cash	5%

Example 7

If the real estate property of Alok is currently valued at Rs. 69 lakh, what will be the difference in lakhs between equity and debt in the proposed structure?

- (A) Rs. 150 lakh
- (B) Rs. 9 lakh
- (C) Rs. 82.5 lakh
- (D) Rs. 67.5 lakh
- (E) Rs. 70.5 lakh

Solution

As per the problem:

46. of the total = Rs. 69 lakh

Total = Rs. 150 lakh

Difference between equity and debt = $70 - 25 = 45\%$ of the total = $0.45 \times 150 = 4.5 \times 15 = \text{Rs. } 67.5 \text{ lakh}$

The correct answer is D.

Example 8

If the difference between the contribution of equity to that of all the other components put together in the proposed structure is Rs. 16 lakh, find the value of cash in the existing structure.

- (A) Rs. 1.6 lakh

- (B) Rs. 2 lakh
- (C) Rs. 2.6 lakh
- (D) Rs. 4 lakh
- (E) Cannot be determined

Solution

As per the problem:

40. of the total = Rs. 16 lakh

Total = Rs. 40 lakh

Cash in the existing structure = 4% of 40 lakh = Rs. 1.6 lakh

The correct answer is A.

Example 9

By what percentage is the contribution of equity in the proposed structure more as compared to the contribution of equity in the existing structure?

- (A) 42%
- (B) 100%
- (C) 120%
- (D) 150%
- (E) 200%

Solution

The required value will be $\frac{70-28}{28} \times 100 = \frac{42}{28} \times 100 = 150\%$

The correct answer is D.

2.14 DI-Graphs and Charts

2.15 What is Measured?

The DI-Graphs and Charts section consists of charts and pie diagrams that you will need to analyse and apply while answering the questions.

Your mental math skills get tested indirectly as you will need to make a lot of quick calculations especially using concepts of percentages, ratios, etc.

Your estimation skills also get tested as, in a lot of the questions, you will be able to arrive at the answer just by intelligent estimation and elimination of wrong answer choices.

2.16 Overall Test Taking Strategies

1. Scan the data once quickly but do not pay too much attention to every small detail as you can always do so later, based on the questions that you get.
2. The figures are all drawn to scale so you can estimate the answer, especially if the answer choices are very far apart.
3. Do not confuse percentages with actual numbers.

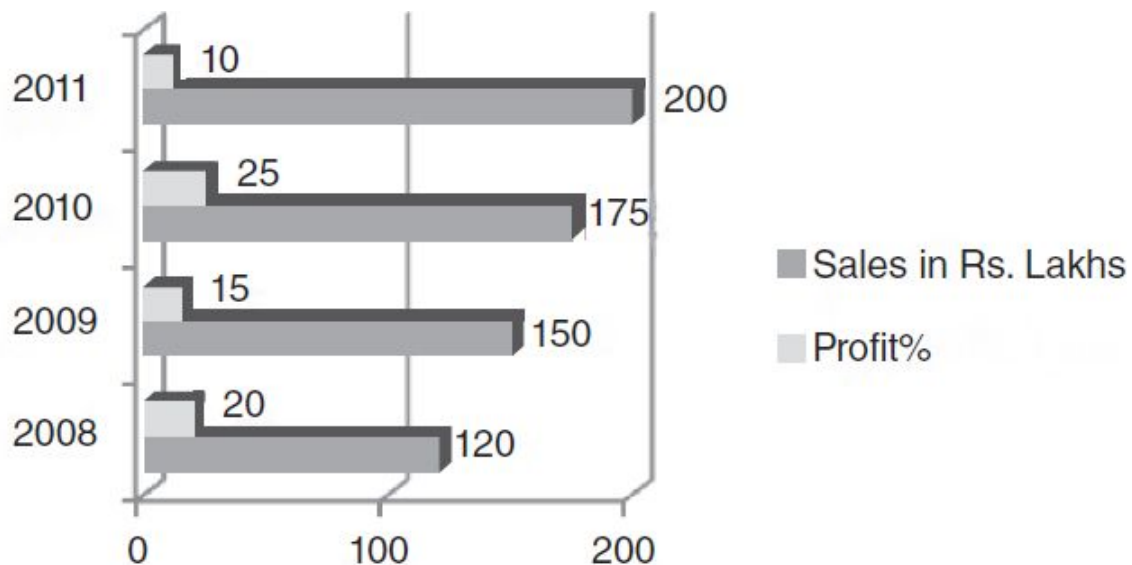
The next few pages will provide you with in-depth strategies for approaching this topic.

1 Bar Graph

A bar graph is a chart whose main purpose is to compare two or more categories. This comparison is done on the basis of

quantitative value associated with each category. Horizontal or vertical bars are used to show comparisons among categories.

Data for Examples 1–3: The given bar graph shows the total sales value (in Rs. lakh) and the profit percentage for a company ABC Ltd. for 4 years from 2008 to 2011. Answer the questions based on the following data.



Example 1

If the total sales is equivalent to the selling price, what is the value of profit for ABC Ltd. for the year 2010?

- (A) Rs. 35 lakh
- (B) Rs. 38.75 lakh
- (C) Rs. 40 lakh
- (D) Rs. 45 lakh
- (E) None of these

Solution

We need to find out the profit for the year 2010. Therefore,

$$CP \times \frac{125}{100} = 175 \Rightarrow CP \times \frac{5}{4} = 175 \Rightarrow CP = 4 \times 35 = 140$$

$$\text{Profit} = 175 - 140 = \text{Rs. } 35 \text{ lakh}$$

The correct answer is A.

Example 2

Which year has shown the highest percentage change in profit %?

- (A) 2008
- (B) 2009
- (C) 2010
- (D) 2011
- (E) Cannot be determined

Solution

Percentage change in profits for 2008 cannot be calculated since we do not know the profits for 2007.

$$\text{Percentage change in profits for 2009} = \frac{(20-15)}{20} = 25\%$$

$$\text{Percentage change in profits for 2010} = \frac{(25-15)}{15} = 66\% \text{ approx}$$

$$\text{Percentage change in profits for 2011} = \frac{(25-10)}{25} = 60\%$$

Thus, the maximum change has been for the year 2010.

The correct answer is C.

Example 3

By what percentage is the sales in 2011 more or less than the cost in 2008?

- (A) 50%
- (B) 100%

(C) 200%

(D) 250%

(D) 300%

Solution

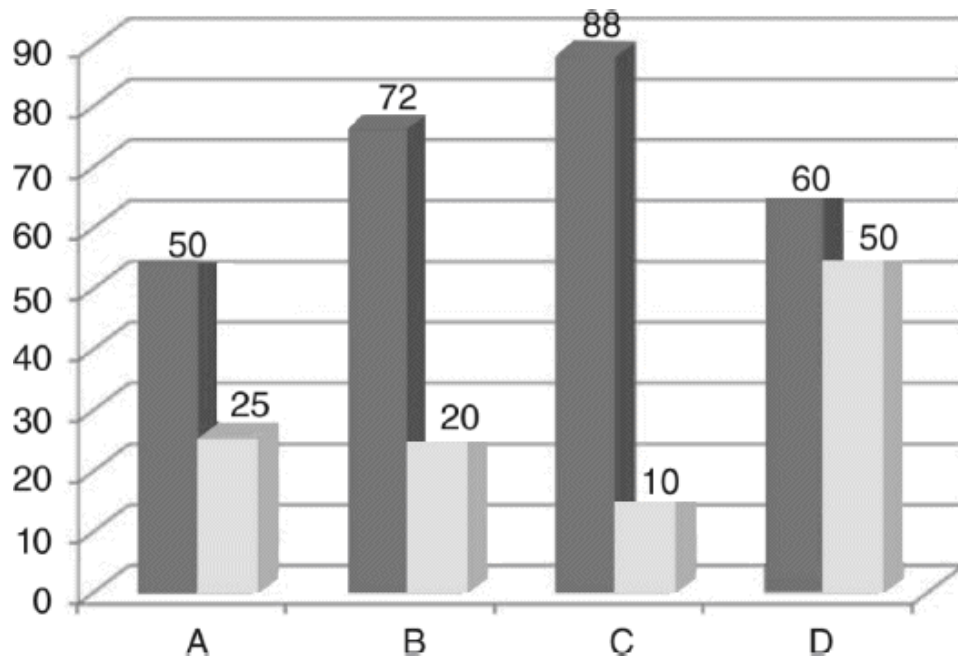
Cost in 2008 = Rs. 100 lakhs

Sales in 2011 = Rs. 200 lakhs

$$\text{Percentage change} = \left(\frac{200 - 100}{100} \right) \times 100 = 100\%$$

The correct answer is B.

Data for Examples 4–9: The following bar graph depicts the details of the number of students in four different sections of grade 1 in Ann Mary School. While the first bar represents the number of students in that section in the current year, the second bar represents the percentage change in the number of students in that section from the previous year.



Further, it was noted that no two sections had the same number of students in any of the two years.

The number of sections that saw an increase in the number of students was the same as the number of sections where the total strength decreased.

Example 4

What was the total strength of Section B in the previous year?

- (A) 60
- (B) 90
- (C) 80
- (D) 70
- (E) Cannot be determined

Example 5

In the previous year, what was the ratio of the number of students in Section C to those in Section D?

- (A) 1:3
- (B) 3:1
- (C) 2:3
- (D) 3:5
- (E) None of these

Example 6

Which among the following sections saw the least change in the number of students from the previous year?

- (A) A
- (B) B
- (C) C
- (D) D

(E) A and C

Example 7

If 50% of the total decrease is attributed to students shifting to other schools while the entire increase is due to new admissions, what is the difference between the number of students shifting to other schools and new admissions?

(A) 18

(B) 21

(C) 26

(D) 39

(E) 60

Example 8

Which two sections saw a decrease in the number of students in the current year as compared to the previous year?

(A) B and C

(B) A and D

(C) B and D

(D) A and C

(E) A and B

Example 9

Find the number of students in the previous year in Section D.

(A) 40

(B) 120

(C) 60

(D) 80

(E) Cannot be determined

General Explanation for Examples 4–9:

Let y be the variable which represents the number of students in each of the four sections in the previous year. Section C has 88 students and there is a percent change of 10% from the previous year. The only possibility is

$$y \times \frac{110}{100} = 88 \Rightarrow y = 80 \text{ students}$$

For section A, the change has to be an increase of 25%.

Therefore,

$$y \times \frac{125}{100} = 50 \Rightarrow y = 40 \text{ students}$$

There will definitely be a decrease in the strength of the other two sections B and D.

For section B, we have

$$y \times \frac{80}{100} = 72 \Rightarrow y = 90 \text{ students}$$

For section D, we have

$$y \times \frac{50}{100} = 60 \Rightarrow y = 120 \text{ students}$$

Now, all the questions can be solved easily:

4. (B)

5. (C)

6. (C)

7. (B) Decrease in section B = $90 - 72 = 18$ students

Decrease in section D = $120 - 60 = 60$ students

Total decrease = 78 students

50 percent of this is due to students shifting to other schools
= 39 students

New admissions = $8 + 10 = 18$ new admissions

Difference = $39 - 18 = 21$

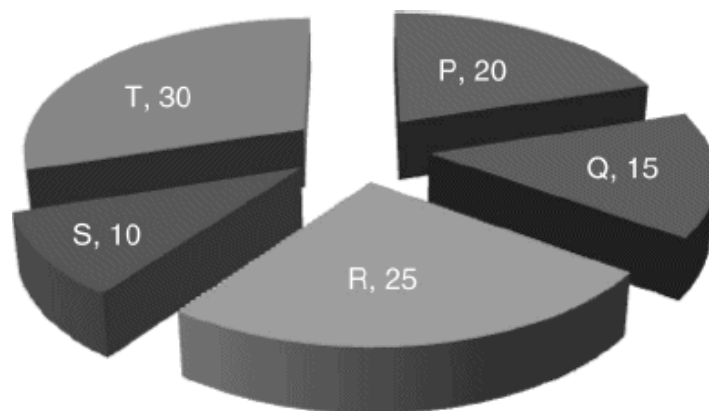
8. (C)

9. (B)

2 Pie Chart

It is a type of graph in which we have a circle, which is divided into sectors each of which represents a proportion of the whole. We can also say a pie is divided into slices where length or area of each slice or sector represents the proportion of the total quantity it represents.

Data for Examples 1–3: The given pie chart shows the percentage market share by volume of five companies P, Q, R, S and T in the television market in the year 2011. The total sale volume-wise in the market in the year 2011 is 4,00,000 TV sets.



Example 1

If S is the others category and company X has a share of 30% in this category, find the number of TV sets sold by company X in the year 2011.

- (A) 10,000
- (B) 12,000
- (C) 15,000
- (D) 18,000
- (E) 20,000

Solution

Total sale of the others category = 10% of 4,00,000 = 40,000
Sales of company X = 30% of 40,000 = 12,000

The correct answer is B.

Example 2

If the total sale of two products P2 and P3 of company P is 30000, find the percentage contribution of products P2 and P3 to the total sales unit-wise of company P in the year 2011.

- (A) 37.5%
- (B) 40%
- (C) 50%
- (D) 60%
- (D) 75%

Solution

P2 and P3 have together sold 30000 units.

Company P has a total sale of 20% of 4,00,000 = 80,000

Therefore, contribution of P2 and P3

$$\frac{30,000}{80,000} \times 100 = 3 \times \frac{100}{8} = 3 \times 12.5 = 37.5\%$$

The correct answer is A.

Example 3

By what percentage is the market share of R more than the market share of P?

- (A) 20%
- (B) 25%
- (C) 30%
- (D) 35%

(D) 40%

Solution

The percentage by which the market share of R is more than that of P is

$$\left(\frac{25 - 20}{20} \right) \times 100 = 25\%$$

The correct answer is B.

2.17 Data Sufficiency

2.18 What is Measured?

Data sufficiency questions measure your ability to analyse data and decide whether it is enough to answer the given question. The actual answer to the question is irrelevant for our purpose.

A lot of the data sufficiency questions will test you on arithmetic concepts such as prime numbers, odd and even numbers, negative exponents and fractions, etc.

2.19 Overall Test Taking Strategies

1. Do not try to solve every statement. You only need to determine whether the given statement is sufficient to answer the given question.
2. Consider each statement separately, especially when you are looking at the second statement.
3. Read the question carefully. If the question asks you whether you can find the value of y and you realise that you cannot do so, you still have a definite answer, that is, no.
4. Remember the answer choices—(A), (B), (C), (D), (E)—and what each of them stands for.

The next few pages will provide you with in-depth strategies for approaching the topic.

1 Data Sufficiency

Introduction

The primary objective of data sufficiency questions is to find out whether the given data is sufficient to answer the question asked. In order to understand data sufficiency, we will need to look at the following aspects:

1. The structure of a data sufficiency problem.
2. The answer choices of a data sufficiency problem.
3. How to approach a data sufficiency problem.
4. The common errors in a data sufficiency problem.

Structure of a data sufficiency problem

In a data sufficiency problem, a question is asked which needs to be answered based on the given data. The given data is usually in the form of two statements called (1) and (2). The question asked needs to be answered based on the two given statements. For example:

Question: What is the speed of the train?

- (1) The train covers 50 km in 30 minutes.
- (2) The length of the train is 200 m.

Answer choices

The answer choices given in a data sufficiency problem are as follows:

- (A) Statement (1) ALONE is sufficient, but Statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but Statement (1) ALONE is not sufficient.
- (C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

Note: Although the options will be the same in most of the cases, it is not necessary that they will always be the same. It is suggested that a student should always read the instructions about the options while answering the question.

Approach to a data sufficiency problem

The following steps are to be followed while solving a data sufficiency problem:

1. Check whether the question can be answered using statement 1 alone without using the data given in statement 2.
2. Check whether the question can be answered using statement 2 alone without using the data given in statement 1.
3. If neither of the two given statements can answer the question alone, combine the data given in the two statements to answer the question asked. In this case, the answer option of the question will be option (C).
4. If the question asked cannot be answered by using the given data, the answer option will be option (E).

Types of questions generally asked

Questions on data sufficiency are asked on the following three topics:

1. Number Properties Based
2. Arithmetic Based
3. Algebra and Probability Based

Common errors in data sufficiency problems

Some commonly made errors are listed as follows:

1. While checking whether the question asked can be answered by using any one of the two statements alone, you pick up data from another statement by mistake.

2. You need to combine the two statements only when you are sure that either of the two statements cannot answer the question alone.
3. If you get more than one answer, it is not acceptable in a data sufficiency problem. For example, if $x^2 = 49$, then x will have two values of $+7$ and -7 . In a situation like this, we would say that the question cannot be answered.
4. Even a definite 'No' is an answer to a data sufficiency problem. For example, if the question asked is: 'Is 1 an example of a prime number?', then it has a definite answer which is 'No'.

These common errors in approach to data sufficiency problems are illustrated through the following examples.

Example 1

What is the value of x ?

(1) $x^2 - 5x + 6 = 0$

Solution

If we solve for x , the quadratic equation will give the values as $x = 2$ or $x = 3$.

So the given problem has more than one answer. This is not acceptable in data sufficiency. We always need a unique solution. It is here that data sufficiency is different from quantitative skills.

Directions for examples 2-10: Each data sufficiency problem consists of a question and two statements, labelled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word counterclockwise), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

Example 2

Can I fill up the tank of 100 L capacity completely?
(Measurements are accurate and there should be no overflow.)

(1) I have a bucket which can exactly measure 5 L.

(2) I have a mug which can exactly measure 3 L.

Solution

Many students make the mistake of thinking that only statement 1 alone can answer the question asked because the important aspect for them is that the tank should be filled whereas the important aspect is whether we can answer the question uniquely about the tank getting filled.

Therefore, in the above example, using statement 1 alone, the answer is yes, the tank can be filled completely and so statement 1 alone is able to answer the question asked.

Similarly, using statement 2 alone, the answer is a definite no, the tank cannot be filled completely and so statement 2 alone is also able to answer the question asked.

So, as per the standard answer options of data sufficiency, the correct answer to the question is option (D).

The correct answer is D.

Let us now look at some more illustrative examples to understand the options better.

Example 3

What is the value of x ?

(1) $x^3 = -27$

(2) $x^2 = 9$

Solution

If we use the first statement alone, we will get a unique value of $x = -3$. Therefore, the question can be answered by using statement 1 alone.

If we use statement 2 alone, we will get two values of x as 3 and -3 . As data sufficiency requires a unique answer, the question cannot be answered by using statement 2 alone.

The correct answer is A.



Important Learning: Even though one of the two answers to the question using statement 2 is -3 which is obtained from statement 1 also, the question cannot be answered by using statement 2 alone.

Example 4

On which day was Naveen born?

(1) On 25th November, Naveen celebrated his ninth birthday.

(2) Naveen was born on a Friday.

Solution

The question is asking about the day when Naveen was born and not the date. From statement 1 we get the date but not

the day.

Using statement 2 alone, we can conclude that Naveen was born on a Friday.

The question can be answered by using statement 2 alone but not by using statement 1 alone.

The correct answer is B.

Example 5

What is the speed of the train?

- (1) In an hour, the train covers a distance of 50 km after stopping for 15 min.
- (2) The train is 150 m long and crosses a man moving in the same direction at 5 km/h in 10 s.

Solution

We can find the speed of the train using statement 1 alone. Do remember, the question does not want us to find the value of the speed of the train.

What is required to be known is that distance covered and time taken can be used to find out the speed of a moving body.

Similarly, using statement 2 alone, the question can be answered.

The correct answer is D.

Example 6

What is the profit earned in rupees?

- (1) The marked price is Rs. 400 and it is sold at a discount of 30%.
- (2) The marked price is 50% more than the cost price.

Solution

In order to answer the question, we will require the values of the cost price and the selling price.

While statement 1 can give us the selling price, we do not know the cost price.

Also, statement 2 can give us the cost price but we do not know the selling price.

Therefore, either of the two statements is not sufficient to answer the question alone.

Both the statements together can answer the question asked.

The correct answer is C.

Example 7

What is the ratio of the prices of A and B?

- (1) Three years ago, their prices were in the ratio 4:5.
- (2) In the last 3 years, the price of both A and B has increased by Rs. 5000.

Solution

When we look at a question like this, many of us would be tempted to mark option (C) as the answer.

The question cannot be answered by using either of the two statements alone, and therefore, we will try and answer the question by combining the two statements.

Let their prices be $4x$ and $5x$, respectively.

Also, their prices have increased by Rs. 5000 each.

The ratio of their prices will be $(4x + 5000):(5x + 5000)$, which will not give any definite value of their prices.

The correct answer is E.

Example 8

In how much time will the work be completed if 15 men work for 8 h every day?

- (1) 20 women working for 7 h can do the work in 12 days.
- (2) 8 men working for 15 h can do the work in 18 days.

Solution

The question cannot be answered by using statement 1 alone because we do not know the efficiency comparison of a man and a woman.

Using statement 2 alone and equating the total work to be done in the section Time and Work, we have

$$8 \times 15 \times 18 = 15 \times 8 \times y$$

Solving, we get $y = 18$ days

The correct answer is B.



Important Learning: Do not make the mistake of picking up information from Statement 1 while checking Statement 2 and vice versa.

Note: In data sufficiency problems that ask for the value of a quantity, the data given in the statements are sufficient only when it is possible to determine exactly one numerical value for quantity.

Example 9

Find the value of the number if it is less than 100.

- (1) The number is a perfect square.
- (2) It is a multiple of 16.

Solution

Using Statement 1 alone, the question cannot be answered as there can be a number of possibilities, such as 1, 4, 9, 16, 25, 36 and so on.

Using Statement 2 alone, there will again be a number of possibilities, such as 16, 32, 48, 64, etc.

However if we combine both the statements, there is only one possibility = 64.

Thus, C is the answer.

The correct answer is C.

Example 10

Find the speed of the stream.

- (1) A log of wood travels 4 km in 3 h.
- (2) Speed of a boat while moving downstream is 7 km/h.

Solution

A log of wood does not have any power of its own so it moves at the same rate as the speed of the stream. Thus, Statement 1 is sufficient to answer the question.

The speed of a boat does not tell us anything about the speed of the stream. So Statement 2 is not sufficient.

The correct answer is A.

3.0 Quantitative Skills Practice

3.1 Practice Questions

Solve the problems and indicate the best of the answer choices given.

Numbers: All numbers used are real numbers.

Figures: A figure accompanying a problem-solving question is intended to provide useful information for solving the problem. Figures drawn as accurately as possible. Exceptions be clearly noted. Lines shown as straight are straight, and lines that appear jagged are also straight. The positions of points, angles, regions, etc., exist in the order shown, and all measures are greater than zero. All figures lie in a plane unless otherwise indicated.

1 Number Properties

1. Which of the following is equal to $\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right)$

(A) $\frac{1}{12}$

(B) $\frac{1}{6}$

(C) $\frac{1}{4}$

(D) $\frac{1}{3}$

(E) $\frac{1}{2}$

2. Express $7.58\bar{3}$ as a fraction:

(A) $\frac{91}{12}$

(B) $\frac{44}{6}$

(C) $\frac{99}{14}$

(D) $\frac{22}{3}$

(E) $\frac{148}{21}$

3. Prakash bought a bag of 15 magic pencils for Rs. 60. One-third of the pencils cost Rs. 2 each and the rest cost Rs. 5 each. If there was a hole in the bag and all of the more expensive pencils fell out, the lost pencils represented approximately what percentage of the money Prakash paid for all the pencils?

(A) 7%

(B) 13%

(C) 67%

(D) 83%

(E) 88%

4. Company H distributed Rs. 4,000 and 180 pens evenly among its employees, with each employee getting an equal integer number of Rupees and an equal integer number of pens. What is the highest number of employees that could work for Company H?
- (A) 9
(B) 10
(C) 20
(D) 40
(E) 180
5. If t is divisible by 12, what is the least possible integer value of a for which $\frac{t^2}{2^a}$ might not be an integer?
- (A) 2
(B) 3
(C) 5
(D) 6
(E) 40
6. If $5^{k+1} = 2,000$, what is $5^k + 1$?
- (A) 399
(B) 401
(C) 1,996
(D) 2,000
(E) 2,001
7. Which of the following is equal to $(\sqrt[2]{x})(\sqrt[3]{x})$?
- (A) $\sqrt[5]{x}$
(B) $\sqrt[6]{x}$
(C) $\sqrt[3]{x^2}$
(D) $\sqrt[5]{x^6}$
(E) $\sqrt[6]{x^5}$

8. If $125^{14}48^8$ is written as an integer, how many consecutive zeroes will that integer have at the end?
- (A) 22
 - (B) 32
 - (C) 42
 - (D) 50
 - (E) 112
9. If n is the smallest of three consecutive positive integers, which of the following must be true?
- (A) n is divisible by 3
 - (B) n is even
 - (C) n is odd
 - (D) $(n)(n + 2)$ is even
 - (E) $n(n + 1)(n + 2)$ is divisible by 3
10. If $\frac{17}{2^{10} \times 5^{13}}$ is expressed as a terminating decimal, how many zeroes are located to the right of the decimal point before the first non-zero digit?
- (A) 10
 - (B) 12
 - (C) 13
 - (D) 15
 - (E) 17
11. If $25^5 4^6 = 10^x + a$, and x is an integer, what could be the minimum positive value of a ?
- (A) 0
 - (B) 30,000
 - (C) 30,000,000
 - (D) 10,000,000,000
 - (E) 30,000,000,000

12. What is the unit digit of 7^{86} ?
- (A) 0
 - (B) 1
 - (C) 3
 - (D) 7
 - (E) 9
13. What is the difference between the sum of all even positive integers between 1 and 100 (inclusive) and the sum of all odd positive integers between 100 and 150?
- (A) -575
 - (B) -475
 - (C) 225
 - (D) 475
 - (E) 575
14. Find the smallest 4-digit number which, when increased by 8, is divisible by 12, 18, 30 and 45. (**Real NMAT Question**)
- (A) 1,072
 - (B) 1,080
 - (C) 1,088
 - (D) 1,096
 - (E) 1,120
15. The sum of the last digits of the numbers of the form $2^{2n} + 1$, for $n = 0, 1, 2, 3$ and 4, when divided by 7 gives a remainder
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) 5

16. If 'a' and 'b' are prime numbers, then what is the H.C.F. of the numbers $(a^2 + b^2)$, $(a + b + 1)$ and $(a^2 + b^2 - 1)$?
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) Cannot be determined
17. A three digit number is such that its hundredth digit is equal to the product of the other two digits which are prime numbers. Also, the difference between the number and its reverse is 297. Then, what is the ten's digit of the number?
- (A) 2
 - (B) 3
 - (C) 5
 - (D) 6
 - (E) 7
18. When a two digit number is divided by the sum of its digits, the quotient is 4. If the digits are reversed, the new number is 6 less than twice the original number. The number is
- (A) 12
 - (B) 21
 - (C) 24
 - (D) 42
 - (E) Both (C) and (D)
19. A five-digit number is formed using the digits 1, 3, 5, 7 and 9 without repetition. What is the sum of all such possible numbers?
- (A) 6666600
 - (B) 6666660
 - (C) 6666666
 - (D) 6666000

(E) None of these

20. A positive integer 'A' is a multiple of 180 and it has 40 factors. If 'A' is less than 3000, then the value of $\frac{A}{40}$ is
- (A) 54
(B) 60
(C) 240
(D) 270
(E) Cannot be determined
21. If the number 5237ab is completely divisible by 3, find the possible values of a + b.
- (A) 2
(B) 5
(C) 8
(D) 15
(E) 16
22. A number A gives a remainder of 7 when divided by 9. Find the remainder when 2A is divided by 9.
- (A) 1
(B) 2
(C) 5
(D) 8
(E) 14
23. At a nature trail camp, one-fifth of the total members went rock climbing; twice the square root of the total members went hiking up a mountain trail. The remaining 10 were exploring in caves. How many members went hiking? (**Real NMAT Question**)
- (A) 5
(B) 10
(C) 15

(D) 20

(E) 25

24. Simplify: $\left[\frac{1}{3} \text{ of } \frac{2}{5} \{ (6 \times 3) - (3 \times 1) \} + \frac{1}{2} - \frac{1}{6} \right]$ (*Real NMAT Question*)

(A) $\frac{1}{3}$

(B) $1\frac{1}{3}$

(C) $2\frac{1}{3}$

(D) $3\frac{1}{3}$

(E) $4\frac{1}{3}$

25. What is the remainder when $1! + 2! + \dots + 600!$ is divided by 6? (*Real NMAT Question*)

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

26. What is the digit in the unit place of $(98^{43} \times 122^{22}) + 729^{59} + 2^{543}$? (*Real NMAT Question*)

(A) 5

(B) 6

(C) 7

(D) 8

(E) 9

27. Which of the following numbers is divisible by 9? (*Real NMAT Question*)

(A) 1,203

(B) 2,256

- (C) 42,651
- (D) 71,623
- (E) 92,423

28. What is the LCM of ${}^nC_1$ and ${}^nC_2$, where n is odd? (**Real NMAT Question**)

- (A) n
- (B) $\frac{n(n-1)}{2}$
- (C) $\frac{(n-1)}{2}$
- (D) $\frac{n}{2}$
- (E) $(n - 1)$

29. The number of female employees in a bank is 7 times the number of male employees in the bank. Which of the following cannot be the total number of employees in the bank? (**Real NMAT Question**)

- (A) 40
- (B) 48
- (C) 54
- (D) 64
- (E) 128

30. If August 15, 1947 was a Friday, then, what was the day on January 26, 1950?

- (A) Thursday
- (B) Friday
- (C) Saturday
- (D) Sunday
- (E) Monday

31. What was the day on April 20, 1984?

- (A) Thursday
- (B) Friday

- (C) Saturday
 - (D) Sunday
 - (E) Monday
32. If in a certain year, the month of January had exactly 4 Wednesdays and 4 Sundays, then January 1 of that year was a -
- (A) Saturday
 - (B) Monday
 - (C) Wednesday
 - (D) Friday
 - (E) Thursday
33. Puja born in 1900s realised that in 1980 his age was the square root of the year of her birth. When was Puja born?
- (A) 1929
 - (B) 1936
 - (C) 1940
 - (D) 1946
 - (E) 1949
34. If 09.12.2001 happens to be a Sunday, then 09.12.1971 would have been a
- (A) Saturday
 - (B) Monday
 - (C) Wednesday
 - (D) Friday
 - (E) Thursday
35. If $\log_{10}2 = 0.3010$, what is the value of $\log_5 256$? (**Real NMAT Question**)
- (A) 3.11
 - (B) 3.26
 - (C) 3.44

(D) 3.67

(E) 3.82

36. Find the value of 'x' if $625^{\log_{36} 6} + 12^{\log_7 49} = 11^{\log_x 169}$

(A) 10

(B) 11

(C) 13

(D) 17

(E) 19

37. If $\log_{30} 3 = x$ and $\log_{30} 5 = y$, then find the value of $\log_8 30$.

(A) $3(1 - x - y)$

(B) $\frac{1}{3(1 - x - y)}$

(C) $\frac{3}{(1 - x - y)}$

(D) $\frac{(1 - x - y)}{3}$

(E) None of these

38. If $a^p = b^q = c^r = d^s$, then find the value of $\log_a (bcd)$.

(A) $p\left(\frac{1}{q} + \frac{1}{r} + \frac{1}{s}\right)$

(B) 1

(C) $\frac{1}{q} + \frac{1}{r} + \frac{1}{s}$

(D) $\frac{p}{\left(\frac{1}{q} + \frac{1}{r} + \frac{1}{s}\right)}$

(E) $\frac{\left(\frac{1}{q} + \frac{1}{r} + \frac{1}{s}\right)}{p}$

39. If $\log_y x = 10$, then find the value of

(A) $\frac{1}{6}$

(B) $\frac{1}{5}$

(C) 5

(D) 6

(E) Both $\frac{1}{6}$ and $\frac{1}{5}$

40. If $P = 625^{\frac{2}{\log_3 25}} + 25^{\log_{125} 27} + 5^{\frac{5}{\log_8 125}}$, then find the value of 'P'.

(A) 90

(B) 92

(C) 122

(D) 136

(E) 154

2 Arithmetic

1. The number that is 50% greater than 80 is what percent less than the number that is 25% less than 200?
(A) 5%
(B) 10%
(C) 15%
(D) 20%
(E) 25%
2. Aakash spends 50% of his income on rent, utilities, and insurance, and 20% on food. If he spends 30% of the remainder on video games and has no other expenditure, what percent of his income is left after all the expenditure?
(A) 0%
(B) 9%
(C) 20%
(D) 21%
(E) 30%
3. In a class of 40 students, exactly 90% had lower marks than Varun's marks. 60 new students join Varun's class. If Varun's marks were higher than those of 80% of the new arrivals, what percent of the combined class now had higher marks than Varun's marks?
(A) 86%
(B) 85%
(C) 16%
(D) 15%
(E) 14%
4. Machines X and Y pack books continuously, each working at a constant rate, but Machine Y works 50% faster than Machine X. If Machine Y packs 48,000 more books in a 24-hour period than

Machine X does, what is Machine X's packing rate in books per hour?

- (A) 4,000
- (B) 6,000
- (C) 8,000
- (D) 12,000
- (E) 16,000

5. The production of rice increased by 75% from 1990 to 1995. From 1995 to 2000, there was a 100% increase. What is the percentage increase in the production of rice from 1990 to 2000? (**Real NMAT Question**)

- (A) 250%
- (B) 280%
- (C) 285%
- (D) 290%
- (E) 295%

6. Ankur bought 5 Pizzas, 7 Samosas and 4 ice-creams. Sanjeev bought 6 Pizzas, 14 Samosas and 8 Ice creams for an amount which was 50% more than what Ankur paid. What percentage of the total amount spent by Ankur was spent on the Pizzas?

- (A) 37.5%
- (B) 45%
- (C) 50%
- (D) 56.5%
- (E) 62.5%

7. By selling the burger at Rs. 260 per piece, Sameer gains 30%. Find the cost price of the burger per piece?

- (A) Rs. 150
- (B) Rs. 200
- (C) Rs. 250

(D) Rs. 300

(E) Rs. 350

8. Ghosh Babu, a trader, marked up his goods 30% over the cost price and then he gave the discount of 5%. What was the profit percentage of Ghosh Babu in the whole transaction?

(A) 19.5%

(B) 21.5%

(C) 23.5%

(D) 25.5%

(E) None of these

9. The value of $(p \% q + q \% \text{ of } p)$ is:

(A) $p \% \text{ of } q$

(B) $q \% \text{ of } p$

(C) $2 \% \text{ of } pq$

(D) $pq \% \text{ of } 3$

(E) None of these

10. 'p' is five times as large as 'q'. By what percent is q less than p?

(A) $16\frac{2}{3} \%$

(B) 37.5%

(C) 60%

(D) 80%

(E) 90%

11. A 735 gm sample of a 16% (by weigh) solution of iodine in alcohol is kept for three days. Some of the alcohol gets evaporated and the concentration of the solution becomes 20% (by weight). What amount of alcohol gets evaporated?

(A) 135 gm

(B) 140 gm

(C) 147 gm

(D) 150 gm

(E) 215 gm

- 12.** The interest rate, compounded annually, that would bring a principal of Rs. 1,200 to a final value of Rs. 1,650 in 2 years is approximately:
- (A) 17%
- (B) 18%
- (C) 19%
- (D) 20%
- (E) 21%
- 13.** An amount becomes 3 times in 6 years on a certain rate of simple interest. In how many years it will become 24 times?
- (A) 48 Years
- (B) 50 Years
- (C) 69 Years
- (D) 70 Years
- (E) 72 Years
- 14.** What is the value of the rate of interest if the difference between the compound interests of the first and the second year is 4 times that of the principal?
- (A) 50%
- (B) 100%
- (C) 150%
- (D) 200%
- (E) 400%
- 15.** Some amount was divided into two equal parts. The first part was invested at 10% per annum at simple interest for 4 years. The second part was invested at 10% per annum at compound interest for 3 years. If the difference in the interests earned from the two investments is Rs. 1000, find the approximate value of the total initial amount.

- (A) Rs. 28,485
- (B) Rs. 28,985
- (C) Rs. 29,485
- (D) Rs. 29,985
- (E) Rs. 30,485

16. The value of a car depreciates at the rate of 10% per annum. If its present value is Rs. 121500, then what was the value of the car two years ago?

- (A) Rs. 100000
- (B) Rs. 150000
- (C) Rs. 200000
- (D) Rs. 250000
- (E) Rs. 300000

17. Ram lent Rs. 800 to a friend for 2 years and one-fourth of this amount to another friend for 3 years. He received Rs. 275 in total as simple interest. What was the rate of interest?

- (A) 10.5%
- (B) 12.5%
- (C) 15.5%
- (D) 17.5%
- (E) 19.5%

18. At what interest rate per annum will a sum of money double itself in 8 years?

- (A) $12\frac{1}{2}\%$
- (B) 13%
- (C) 15%
- (D) 17%
- (E) 19%

19. Parikshit invests Rs. 1546 in BNP bank at a certain rate of compound interest per annum. At the end of 8 years, he finds that his money has doubled. What approximately is the rate of interest BNP bank paid him?
- (A) 9%
 - (B) 12%
 - (C) 15%
 - (D) 16%
 - (E) 18%
20. Giri divided his property between his children Suma and Dev. Suma invested her share at 10% per annum simple interest and Dev invested his share compounded at 8% per annum. At the end of 2 years, the interest received by Suma is Rs. 13,360 more than the interest received by Dev. What was Suma's share if the total amount divided was Rs. 2,50,000? (**Real NMAT Question**)
- (A) Rs. 50,000
 - (B) Rs. 63,360
 - (C) Rs. 1,13,360
 - (D) Rs. 1,50,000
 - (E) Rs. 1,63,360
21. If Rs. 23,579 triples itself in 3 years when invested in a bond for which the investment interest rate is compounded annually, then in how many years will it become 27 times of itself? (**Real NMAT Question**)
- (A) 6
 - (B) 9
 - (C) 18
 - (D) 27
 - (E) 81
22. Arvind sells clothes at a roadside market for which he pays Rs. 150 per day to rent a table plus Rs. 10 per hour to his salesman. He sells

an average of Rs. 78 worth of clothes per hour. Assuming no other costs, which of the functions below best represents profit per day P in terms of hours h that Arvind works for?

- (A) $P(h) = 238 - 10h$
- (B) $P(h) = 72 - 10h$
- (C) $P(h) = 68h - 150$
- (D) $P(h) = 78h - 160$
- (E) $P(h) = -160h + 78$

- 23.** A batch of clips costs Rs. $(p + 15)$ for a company to produce and each batch sells for Rs. $p(9 - p)$. For which of the following values of p does the company make a profit?

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 7

- 24.** In a school exhibition, hand-made crafts are displayed for sale. Some students are assigned the work of selling crafts. The overall profit p depends on the number of students x selling the crafts on that particular day and is given by the equation $p = 250x - 5x^2$. The school manager claims to have made a maximum profit. Find the number of students engaged in selling the crafts and the maximum profit made. (Real NMAT Question)

- (A) 25 and Rs. 1,800
- (B) 25 and Rs. 2,900
- (C) 25 and Rs. 3,125
- (D) 30 and Rs. 3,900
- (E) 34 and Rs. 4,000

- 25.** A person purchased a smartphone for Rs. 8,000 and sold it at a profit of 25%. From that amount, he purchased another phone and

sold it at a loss of 20%. What is his overall profit or loss? (**Real NMAT Question**)

- (A) profit of Rs. 2,000
- (B) profit of Rs. 1,000
- (C) loss of Rs. 2,000
- (D) loss of Rs. 1,000
- (E) neither profit nor loss

26. A shopkeeper claims a loss of 4% on his goods, but uses weight equal to 840 gm instead of 1 kg. The shopkeeper actually makes a:

- (A) $11\frac{1}{7}\%$ gain
- (B) $14\frac{2}{7}\%$ gain
- (C) 4% loss
- (D) 4% gain
- (E) 2% loss

27. A product priced at Rs. 1000 would earn a shopkeeper a profit of 15%. Find the profit percentage earned by him if he decides to sell the product at a discount of Rs. 50 during the festivals.

- (A) 3.34%
- (B) 9.15%
- (C) 9.25%
- (D) 9.30%
- (E) 9.50%

28. On selling 630 pens, a shopkeeper makes a profit equal to the selling price of 90 pens. Find the approximate profit percentage.

(**Real NMAT Question**)

- (A) 12.5%
- (B) 14.28%
- (C) 16.67%
- (D) 20%

(E) 22.22%

29. The capital of a company, Estyle, is made of 75,000 preferred shares with a dividend of 15% and 20,000 common shares, with the par value of each type of share as Rs. 10. The total profit of Estyle was Rs. 2,40,000 of which Rs. 40,000 was kept in a reserve fund. The remaining profit was distributed to the shareholders. What would be the difference in the dividend percentage given to the common shareholders if the amount kept away in the reserve fund was reduced to Rs. 25,000? **(Real NMAT Question)**

(A) 5.75%
(B) 7.5%
(C) 10%
(D) 12.75%
(E) 15%

30. Yalda sold two MP3 players using two different online sites. She sold one for Rs. 1,710 at a loss of 5% and the other for Rs. 2,520 at a profit of 20%. What is her total profit or loss percentage? **(Real NMAT Question)**

(A) gain of 4.8%
(B) loss of 5.1%
(C) loss of 6.4%
(D) gain of 8.5%
(E) loss of 9.2%

31. Satish works on 15% commission on the total cost of the book sets he sells. He sold 10 book sets at Rs. 850 each, 5 at Rs. 750 each, and 10 at Rs. 700 each. How much more commission would he have made had he sold all the book sets at Rs. 850 each? **(Real NMAT Question)**

(A) Rs. 100
(B) Rs. 150
(C) Rs. 300
(D) Rs. 350

(E) Rs. 400

32. The ratio of the cost price to the selling price of an item is 4 : 5. The item is sold at a profit of Rs. 500. What is the selling price of the item? (**Real NMAT Question**)

(A) Rs. 1,000

(B) Rs. 1,500

(C) Rs. 2,000

(D) Rs. 2,500

(E) Rs. 4,500

33. How much tea selling at Rs. 10.40 per kg should be mixed with tea selling at Rs. 8.80 per kg to get a resulting mixture of 15 kg for Rs. 146.40? (**Real NMAT Question**)

(A) 6 kg

(B) 7 kg

(C) 8 kg

(D) 9 kg

(E) 10 kg

34. A chemist is mixing a solution of ink and water. She currently has 30 litres of mixture solution, of which 10 litres are ink. How many litres of ink should the chemist add to her current mixture to attain a 50:50 mixture of ink and water if no additional water is added?

(A) 2.5

(B) 5

(C) 10

(D) 15

(E) 20

35. A full glass of lemonade is a mixture of 20% lime juice and 80% soda. The contents of the glass are poured into a pitcher that is 200% bigger than the glass. The remainder of the pitcher is filled with 16 litres of water. What was the original volume of lime juice in the mixture?

- (A) 1.6 litres
- (B) 3.2 litres
- (C) 4.8 litres
- (D) 6.4 litres
- (E) 8 litres

36. In a college dramatics team, the ratio of boys to girls is 6 : 7. If there are 2 more girls than boys in the team, how many boys are in the team?

- (A) 12
- (B) 18
- (C) 24
- (D) 30
- (E) 36

37. X cornflake is 55% fibre and Y cornflake is 70% fibre. Sharad combines a certain amount of the two cereals in a single bowl, creating a mixed cereal that is 65% fibre. If the bowl contains 120 grams of cereal, how much of the cereal, in grams, is X?

- (A) 30
- (B) 40
- (C) 60
- (D) 80
- (E) 90

38. If $a:b = b:c = c:d = 3$, then find the value of $\frac{d^2 + c^3 + b^2c}{cd + bc^2 + abc}$ (**Real NMAT Question**)

- (A) $\frac{1}{6}$
- (B) $\frac{1}{3}$
- (C) 3
- (D) 6
- (E) Cannot be determined

39. In what ratio, solution X which contains 50% milk and solution Y which contains 30% milk be mixed so that the obtained solution contains 45% milk?
- (A) 1 : 3
 - (B) 2 : 3
 - (C) 3 : 2
 - (D) 3 : 5
 - (E) 3 : 1
40. A tank has a solution consisting of milk and water in equal proportion. This solution is transferred into a vessel having 100 ml pure water at the rate of 10 ml per second. In how much time from the start of the transfer, will the ratio of milk to water in the vessel be 1 : 3?
- (A) 5 seconds
 - (B) 10 seconds
 - (C) 15 seconds
 - (D) 20 seconds
 - (E) 25 seconds
41. The sum of the ages of the six members in a family is 130 years. If the age of the children is in the ratio 1:2:6:7 while the combined age of their parents is 82 years, find the age of the eldest child.
- (A) 7 years
 - (B) 14 years
 - (C) 21 years
 - (D) 28 years
 - (E) 35 years
42. A rectangular playground has a length that is twice as great as its width. If its length is halved while its width is quadrupled, what is the ratio of its original area to its new area? (**Real NMAT Question**)
- (A) 1 : 2
 - (B) 1 : 3

(C) 1 : 4

(D) 1 : 5

(E) 1 : 6

43. Two jars P and Q contain the same quantity of a mixture of milk and water. The milk and water in P and Q are in the ratio 5 : 2 and 4 : 1 respectively. What will be the ratio in which these two mixtures have to be blended to obtain a new mixture of milk and water in the ratio of 3 : 1? (**Real NMAT Question**)

(A) 5 : 6

(B) 1 : 1

(C) 4 : 3

(D) 7 : 5

(E) 3 : 2

44. If the average of a, b, c, 5, and 6 is 6, what is the average of a, b, c, and 13?

(A) 8

(B) 8.5

(C) 9

(D) 9.5

(E) 10.5

45. Average weight of 37 students is 42 kg. When their teacher joined them, their average weight increased by 2 kg. What is the weight of the teacher?

(A) 112 kg

(B) 114 kg

(C) 116 kg

(D) 118 kg

(E) 120 kg

46. Two persons of average age 40 years leave a group and hence the average age of the remaining group increases from 50 to 52 years.

Find the number of persons originally in the group.

- (A) 5
 - (B) 7
 - (C) 8
 - (D) 10
 - (E) 12
47. If the average weight of 8th, 9th and 10th class is in the ratio of a:b:c and the number of students in class 8th, 9th and 10th is in the ratio of x:y:z, then the average weight of all the three classes considered together is
- (A) $\frac{a+b+c}{x+y+z}$
 - (B) $\frac{a}{x} + \frac{b}{y} + \frac{c}{z}$
 - (C) $\frac{ax+by+cz}{x+y+z}$
 - (D) $\frac{ax+by+cz}{a+b+c}$
 - (E) Cannot be determined
48. The average age of a husband and wife who were married 5 years ago, was 25 years then. The average age of the family including the husband, the wife and two children who were born during the interval is 16 years now. How old are the children now? [All of them have different ages with integral values.]
- (A) 1 year, 3 years
 - (B) 4 years, 1 year
 - (C) 2 years, 3 years
 - (D) 2 years, 2 years
 - (E) None of these
49. In a group of students, if a student aged 19 years is replaced by a student aged 25 years, the average age of the group increases by 0.4 years. Find the number of students in the group. (**Real NMAT Question**)

- (A) 12
- (B) 13
- (C) 14
- (D) 15
- (E) 16

50. The average age of three people living in a house – man, woman and child, is 24 years. If the man leaves and his mother stays in his place, then the average age in the house becomes 34 years. How much older is the mother than her son? (*Real NMAT Question*)

- (A) 20
- (B) 25
- (C) 30
- (D) 32
- (E) 36

51. The time it takes to construct a hut is inversely proportional to the number of workers doing the work. If it takes 40 workers giving 3 hours each to do the job, how long will it take for 140 workers to do the job, to the nearest minute?

- (A) 51 minutes
- (B) 52 minutes
- (C) 53 minutes
- (D) 54 minutes
- (E) 55 minutes

52. A ski resort has enough wood to keep 20 rooms heated for 14 days. If the resort decides to save wood by turning off the heat in 5 unoccupied rooms, and each room requires the same amount of wood to heat it, how many extra FULL days will the wood supply last?

- (A) 3
- (B) 4
- (C) 5

(D) 18

(E) 19

- 53.** Working alone at their respective constant rates, Ajay can complete a certain job in 4 hours, while Firoz can do the same job in 3 hours. Ajay and Firoz worked together on the job and completed it in 2 hours, but while Ajay worked this entire time, Firoz worked for some of the time and took 3 breaks of equal length. How many minutes long were each of Firoz' breaks?

(A) 5 minutes

(B) 10 minutes

(C) 15 minutes

(D) 20 minutes

(E) 25 minutes

- 54.** A machine can manufacture 20 pens per hour, and exactly 10 such pens fit into every box. Mahesh packs pens in boxes at a constant rate of 3 boxes per hour. If the machine ran for 2 hours and was then turned off before Mahesh started packing the pens in boxes, how many minutes would it take Mahesh to pack all the pens that the machine had made?

(A) 40 minutes

(B) 45 minutes

(C) 80 minutes

(D) 160 minutes

(E) 800 minutes

- 55.** Two taps can separately fill a tank in 4 minutes and 5 minutes respectively. Due to a small hole at the bottom of the tank, the two taps together take 30 seconds more time to fill the tank. The hole can empty the completely filled tank in

(A) $\frac{980}{71}$ minutes

(B) $\frac{980}{81}$ minutes

- (C) $\frac{980}{91}$ minutes
- (D) $\frac{980}{61}$ minutes
- (E) $\frac{981}{51}$ minutes

56. Three taps P, Q and R when filling together can fill a cistern in 3 hours. After 1 hour tap P is closed and the cistern is filled in 4 more hours. Find the time in which tap P alone can fill the cistern?

- (A) 3 hours
- (B) 4 hours
- (C) 5 hours
- (D) 6 hours
- (E) 7 hours

57. Pipes P and Q can fill a tank in 12 minutes and 16 minutes respectively. Both are kept open for X minute(s) and then Q is closed and P fills the rest of the tank in 5 minutes. The time X after which Q was closed is

- (A) 2 minutes
- (B) 3 minutes
- (C) 4 minutes
- (D) 6 minutes
- (E) 7 minutes

58. Pipe X pours a mixture of acid and water, and pipe Y pours pure water into a bucket. After 1 hour, the bucket got filled and the concentration of acid in the bucket was noted to be 8%. If pipe Y was closed after 30 minutes and pipe X continued to pour the mixture, concentration of acid in the bucket after 1 hour would have been 10%. What is the ratio of acid to the water in the mixture coming out of pipe X?

- (A) 13: 2
- (B) 2 : 15
- (C) 3 : 20

- (D) 1 : 5
- (E) 2 : 13

59. Two taps P and Q can fill a cistern in 12 minutes and 18 minutes respectively. If both the taps are opened together, how long it take to fill the cistern?

- (A) $\frac{5}{36}$ minutes
- (B) $5\frac{1}{5}$ minutes
- (C) $6\frac{1}{5}$ minutes
- (D) $7\frac{1}{5}$ minutes
- (E) None of these

60. There are 12 workers who have been recruited to dig a 20 km long tunnel. It takes one worker to dig 250 m of tunnel in a week. How many more workers are needed to complete the work in 2 weeks?

- (A) 12
- (B) 18
- (C) 20
- (D) 24
- (E) 28

61. If 33 unskilled workers can do a work in 15 days of 12 hours each, how many skilled workers can do 50% more work in 11 days of 9 hours each? (Assume that it takes 2 skilled workers to do the work of 5 unskilled workers.)

- (A) 36
- (B) 42
- (C) 64
- (D) 90
- (E) 100

62. Ajay finishes a work in certain number of days. He got two assistants who work $\frac{3}{4}$ as fast as him. If all three work together, then in what fraction of time would they finish the job as compared to Ajay working alone?

(A) $\frac{5}{3}$
(B) $\frac{3}{5}$
(C) $\frac{2}{3}$
(D) $\frac{2}{5}$
(E) $\frac{3}{2}$

63. A and B can do a piece of work in $22\frac{2}{9}$ days, B and C can do it in $16\frac{2}{3}$ days, A and C can do the work in $15\frac{5}{13}$ days. Arrange the three in decreasing order of productivity.

(A) $C > A > B$
(B) $B > C > A$
(C) $A > C > B$
(D) $C > B > A$
(E) $B > A > C$

64. Nishit works twice as fast as Pradeep. Nishit and Pradeep together can work three times faster than Bhuvan. If Nishit, Pradeep and Bhuvan together work on a job, in what ratio should they share the earnings? (**Real NMAT Question**)

Note: The ratio of individual share of earnings for all 3 workers is the same as the ratio of their relative efficiencies.

(A) 2 : 1 : 1
(B) 2 : 3 : 1
(C) 4 : 2 : 1
(D) 4 : 2 : 3
(E) 4 : 3 : 2

65. FDB Builders was awarded the contract to construct a bridge. The company employed 100 workers to finish the work in 120 days. When four-fifths of the work was completed in 80 days, the company wanted to reduce the number of workers. How many workers can be let go without affecting the completion schedule of the construction of the bridge? (**Real NMAT Question**)
- (A) 25
 - (B) 40
 - (C) 50
 - (D) 65
 - (E) 75
66. A tank can be filled by a pipe in 10 minutes and can be emptied by another pipe in 8 minutes. If both pipes are opened when the tank is full, then how long will it take for the tank to be empty? (**Real NMAT Question**)
- (A) 1 hours
 - (B) 1.5 hours
 - (C) 30 minutes
 - (D) 40 minutes
 - (E) 45 minutes
67. Sanya, Babli and Jhanvi started a new business. Sanya's capital was invested for a period which was equal to four times Jhanvi's period of investment whereas Sanya and Babli invested for the same period. Also, twice Sanya's investment is equal to Jhanvi's investment, and Babli's investment is equal to $\frac{1}{2}$ of Sanya's investment. If the total year-end profit from this business yielded Rs. 4,40,000, then what was the total share of Sanya and Babli in this profit? (**Real NMAT Question**)
- (A) Rs. 2,40,000
 - (B) Rs. 2,50,000
 - (C) Rs. 2,55,000
 - (D) Rs. 2,60,000

(E) Rs. 3,30,000

- 68.** Tina, Ishan, Abhishek and Fatima jointly started a business and invested a total of Rs. 80. If Tina's share increases by Rs. 3, Ishan's share increases by one-third of his share, Abhishek's share decreases by 20% and Fatima's share decreases by Rs. 4, all of them would have equal amounts of money. What is Fatima's original share?

(A) Rs. 20.25
(B) Rs. 23. 50
(C) Rs. 23.75
(D) Rs. 24.25
(E) Rs. 24.75

- 69.** Mukesh, Manish, Lalu and Jaggi bought a MOKIA mobile for £60. Mukesh paid one-half of the sum of the amounts paid by the other persons. Manish paid one-third of the sum of the amounts paid by the other persons. Lalu paid one-fourth of the sum of the amounts paid by the other persons. How much did Jaggi have to pay?

(A) £ 13
(B) £ 15
(C) £ 17
(D) £ 23
(E) None of these

- 70.** Yogesh and Mohan, two business partners, invest Rs. 21000 and Rs. 17500 respectively in their garment business and at the end of the year both of them make a profit of Rs. 26400. Find their individual shares in the profit.

(A) Rs. 14400 and Rs. 12000
(B) Rs. 12000 and Rs. 14400
(C) Rs. 14000 and Rs. 12400
(D) Rs. 14200 and Rs. 12200
(E) none of these

3 Algebra and Probability

1. If $3x^3 - 7 = 185$, what is $x^2 - x$?
 - (A) -4
 - (B) 8
 - (C) 12
 - (D) 16
 - (E) 27

2. A certain number of teams participated in a charity Rugby tournament. Each team played with every other team participating in the tournament exactly once. If the number of matches played in the tournament is 120, then how many teams participated in the tournament? (**Real NMAT Question**)
 - (A) 8
 - (B) 10
 - (C) 14
 - (D) 15
 - (E) 16

3. If the roots of the equation $ax^2 + bx + c = 0$ are reciprocal of the roots of the equation $px^2 + qx + r = 0$, then which of the following represents relation(s) between a , b , c , p , q and r ? (**Real NMAT Question**)
 - (A) $a = \frac{1}{p}$
 - (B) $b = \frac{1}{q}$
 - (C) $c = \frac{1}{r}$
 - (D) $a = p$, $c = r$ and $b = 1$
 - (E) $a = r$, $c = p$ and $b = q$

4. If a , b and c are the three positive integers in geometric progression, then the roots of the equation $ax^2 + 4bx + 2c = 0$ are
- (A) Imaginary
 - (B) Equal
 - (C) Rational
 - (D) Real
 - (E) Irrational
5. If p and q are roots of $x^2 + 7x + 12 = 0$, then the equation whose roots are $(p + q)^2$ and $(p - q)^2$ is
- (A) $x^2 - 50x + 49 = 0$
 - (B) $x^2 + 50x - 49 = 0$
 - (C) $x^2 - 10x + 3 = 0$
 - (D) $x^2 - 10x + 4 = 0$
 - (E) $x^2 - 50x - 49 = 0$
6. Which of the following could be the quadratic equation for which one root is $1\frac{1}{2}$ times the other root and the difference between the roots is 1?
- (A) $x^2 + 3x + 3 = 0$
 - (B) $x^2 + 4x + 3 = 0$
 - (C) $x^2 - 5x + 6 = 0$
 - (D) $x^2 + x - 6 = 0$
 - (E) $x^2 - 3x - 3 = 0$
7. If p and q are the roots of the equation $ax^2 + bx + c = 0$, then what is the value of $p^4 - q^4$? (**Real NMAT Question**)
- (A) $a^4 - b^4 + c^4$
 - (B) $a^4 + b^4 - c^4$
 - (C) $\pm \frac{b}{a^4}(b^2 - ac)$

- (D) $\pm \frac{b}{a^4}(b^2 - 2ac)$
 (E) $\pm \frac{b}{a^4}(b^2 - 2ac)\sqrt{b^2 - 4ac}$

8. If $2(x - 1)^3 + 3 \leq 19$, then the value of x must be:

- (A) greater than or equal to 3
 (B) less than or equal to 3
 (C) greater than or equal to -3
 (D) less than or equal to -3
 (E) less than -3 or greater than 3

9. If $|3a + 7| \geq 2a + 12$, then

- (A) $a \leq -\frac{19}{5}$
 (B) $a \geq -\frac{19}{5}$
 (C) $a \geq 5$
 (D) $a \leq -\frac{19}{5}$ or $a \geq 5$
 (E) $-\frac{19}{5} \leq a \leq 5$

10. If x is an integer and $\sqrt{192} < x\sqrt{12}$ and $\frac{x}{\sqrt{12}} < \sqrt{12}$ which of the following can be the value of x ?

- (A) 2
 (B) 3
 (C) 4
 (D) 5
 (E) 12

11. If $\left|\frac{a}{b}\right|$ and $\left|\frac{x}{y}\right|$ are reciprocals, and, which of the following must be true?

- (A) $ab < 0$
 (B) $\frac{a}{b}\left(\frac{x}{y}\right) < -1$

- (C) $\frac{a}{b} < 1$
- (D) $\frac{a}{b} = -\frac{y}{x}$
- (E) $\frac{y}{x} > \frac{a}{b}$

12. It costs a certain chair manufacturing unit Rs. 11,000 to operate for one month, plus Rs. 300 for each chair produced during the month. Each of the chairs sells for a retail price of Rs. 700. What is the minimum number of chairs that the manufacturing unit must sell in one month to make a profit?
- (A) 26
 - (B) 27
 - (C) 28
 - (D) 29
 - (E) 30
13. Which of the following describes all possible solutions to the inequality $|p + 5| < 9$?
- (A) $p < 4$
 - (B) $p > -14$
 - (C) $4 > p > -14$
 - (D) $-11 > p > 3$
 - (E) $p > 4$ or $p < -14$
14. What is the minimum value of $\left(x^{2401} + \frac{1}{x^{2401}} + 2 \times x^{2401} \times \frac{1}{x^{2401}}\right)^{1/2}$, where $x > 0$? (**Real NMAT Question**)
- (A) 2
 - (B) 4
 - (C) 16
 - (D) 49
 - (E) It cannot be determined.

15. Manish has 60 marbles that he wants to divide among himself and his 12 friends. The marbles don't necessarily have to be divided equally. If Manish wants to have more marbles than any of his friends, what is the least number of marbles he can have?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 12

16. If $a^2 - b^2 = 0$ and $ab \neq 0$ which of the following must be true? Indicate all such statements.

1. $a = b$
2. $|a| = |b|$
3. $\frac{a^2}{b^2} = 1$

(A) 1 only
(B) 2 only
(C) 3 only
(D) 1 and 2 only
(E) 2 and 3 only

17. If $(x - y) = \sqrt{20}$ and $(x + y) = \sqrt{12}$ what is the value of $x^2 - y^2$?

(A) $2\sqrt{15}$
(B) $4\sqrt{15}$
(C) $3\sqrt{20}$
(D) $6\sqrt{12}$
(E) $2\sqrt{21}$

18. If $ab \neq 0$, $\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} =$

(A) 1
(B) $a - b$

- (C) $(a + b)(a - b)$
- (D) $(a^2 + b^2)(a^2 - b^2)$
- (E) $\frac{a-b}{a+b}2\sqrt{2}$

19. Which of the following is equal to $(a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2$?

- (A) $5a^2$
- (B) $5a^2 + 10$
- (C) $a^2 + 10$
- (D) $5a^2 + 6a + 10$
- (E) $5a^2 - 6a + 10$

20. a is inversely proportional to b . Also, it is given that $a = 24$ when $b = 2$. What is the value of b when $a = 6$?

- (A) -2
- (B) -1
- (C) 2
- (D) 4
- (E) 8

21. Three people sit down to eat 14 pieces of cake. If two of the people eat the same number of pieces, and the third person eats two more pieces than each of the other two, how many pieces are eaten by the third person?

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 7

22. There are a number of beads of three different colours: red, blue and yellow, and each colour has a different value. If the value of a red bead plus a blue bead is 4.25, the value of a blue bead plus a yellow

bead is 2.75, and the value of a red bead plus a blue bead plus a yellow bead is 4.5, what is the value of a red bead plus a yellow bead?

- (A) 0.25
- (B) 2
- (C) 2.25
- (D) 2.75
- (E) 3

- 23.** National Cricket Academy offers two different pricing packages for cricket coaching. Under the 'Regular' pricing plan, classes can be bought for a flat rate of Rs. 80 per hour. Under the 'Exclusive' pricing plan, after paying an initial fee of Rs. 495, classes can be availed for a rate of Rs. 15 per hour. If Karan buys the 'Exclusive' pricing plan, how many classes does he need to take in order to have spent exactly 40% less than he would have under the 'Regular' plan?

- (A) 10
- (B) 12
- (C) 15
- (D) 18
- (E) 20

- 24.** A student took a test in which 3 marks were given for each correct answer and 0.5 marks were deducted for an incorrect answer. If the test had 25 questions and the student attempted all the questions and got 40 marks in total, what is the difference between the number of correct and incorrect answers?

- (A) 5
- (B) 10
- (C) 12
- (D) 15
- (E) 18

- 25.** A group of friends contributed to the cost of a party where each person had to contribute the same integer amount. Since three

people did not participate, the remaining people had to pay Rs. 10 more. If the total amount contributed is the minimum value possible, what would be the per person contribution had 10 people contributed to the party?

- (A) Rs. 2
- (B) Rs. 5
- (C) Rs. 6
- (D) Rs. 8
- (E) Rs. 10

26. If $p + q + r = 0$, where $a \neq b \neq c$, then $\frac{p^2}{2p^2 + qr} + \frac{q^2}{2q^2 + pr} + \frac{r^2}{2r^2 + pq} =$

- (A) 0
- (B) 1
- (C) -1
- (D) pqr
- (E) $p + q + r$

27. Out of a group of swans, seven times half of the square root of the number of swans were seen going away from a bank of a river and only one pair remained in the water. How many swans were there in the group?

- (A) 9
- (B) 16
- (C) 25
- (D) 36
- (E) 49

28. If $\frac{1}{p} + \frac{1}{q} = m$ and $pq = \frac{1}{n}$, find $\frac{1}{p^2} + \frac{1}{q^2}$

- (A) $\frac{1}{m^2} - \frac{2}{n}$
- (B) $m^2 - \frac{2}{n}$
- (C) $m^2 - 2n$

(D) $\frac{1}{m^2} - 2n$

(E) $\frac{1}{m^2} + 2n$

29. Let $f(x + 2) + f(5x + 6) = 2x - 1$ for all real x . Find the value of $f(1)$.

(A) -2

(B) -1

(C) $\frac{-5}{2}$

(D) $\frac{-3}{2}$

(E) None of these

30. For what value of K , the given set of equations would have no solution?

$$4x - Ky = -7 \text{ and } 5x + 3y = 2$$

(A) $\frac{12}{5}$

(B) 0

(C) $\frac{-12}{5}$

(D) $\frac{-6}{5}$

(E) $\frac{6}{5}$

Directions for Questions 31 and 32: Answer the questions based on the following.

The following operations are defined for real numbers.

$A @ B = A$ if A is greater than B else $A @ B = B$

$A \% B = AB$ if $A \times B$ is positive else $A \% B = A$

Note that all other mathematical symbols have their usual meanings.

31. $[(-4)@(-5)]\%2$

(A) -8

(B) -10

(C) -5

(D) -4

(E) -7

32. $\frac{1@-1}{(-K)@(-K)} \%K, K \neq 0, K \neq 0$

(A) K^2

(B) $\frac{-1}{K}$

(C) $\frac{5}{4}$

(D) 1

(E) Cannot be determined

33. If the sum of the roots of a quadratic equation is $b = \frac{5}{4}c$ times the product of the roots, find the relation between b and c .

(A) $b = \frac{4}{5}c$

(B) $b = -\frac{5}{4}c$

(C) $b = -\frac{4}{5}c$

(D) $b = -\frac{4}{5}c$

(E) $b = -\frac{2}{5}c$

34. If a and b are positive integers such that $a^2 + 2b = b^2 + 2a + 5$, find the value of b . (**Real NMAT Question**)

(A) 0

(B) 1

(C) 2

(D) 3

(E) Cannot be determined

35. Manoj plans to work at a coffee shop during his summer holidays. He will be paid as per the following schedule: at the end of the first week, he will receive Rs. 1000. At the end of each subsequent week,

he will receive Rs. 1000, plus an additional amount equal to the sum of all payments he has received in the previous weeks. How much money will Manoj be paid in total if he works for 6 weeks at this coffee shop?

- (A) Rs. 18000
- (B) Rs. 20000
- (C) Rs. 42000
- (D) Rs. 63000
- (E) Rs. 81000

36. If the collection of a movie is Rs. 100,000 for the first day, Rs. 120,000 for the second day, Rs. 140,000 for the third day and so on, that is, the collection increases by Rs. 20,000 every day, then find the total collection for the first 10 days.

- (A) Rs. 1200,000
- (B) Rs. 1400,000
- (C) Rs. 1600,000
- (D) Rs. 1700,000
- (E) Rs. 1900,000

37. On January 1, Ajit put Re 1 in his piggy bank. Every day, he put in Rs. 2 more than the total amount of money already in the piggy bank. Which of the following expressions gives the total amount of money in Ajit's piggy bank at the end of January? (**Real NMAT Question**)

- (A) 2^{30}
- (B) 2^{31}
- (C) $3(2^{30}) - 2$
- (D) $3(2^{31}) - 2$
- (E) $3(2^{30})$

38. A person saves Rs. 200 more each year than in the previous year. If he started with Rs. 400 in the first year, how many years would he take to save Rs. 18,000 (excluding interest)?

- (A) 10 years
- (B) 12 years
- (C) 15 years
- (D) 18 years
- (E) None of these

39. If the second term of a geometric progression is 6 and the fifth term is 48, then what is its tenth term?

- (A) 2236
- (B) 2146
- (C) 1536
- (D) 1246
- (E) 1146

40. p, q, r and s are any four positive real numbers, the minimum value of $\frac{p}{q} + \frac{q}{r} + \frac{r}{s} + \frac{s}{p}$ is

- (A) 0
- (B) 1
- (C) 2
- (D) $2\sqrt{2}$
- (E) 4

41. If a, b, c and d are in GP, then $(a^3 + b^3)^{-1}, (b^3 + c^3)^{-1}$, and $(c^3 + d^3)^{-1}$ are in _____.

- (A) AP
- (B) GP
- (C) HP
- (D) AP or GP
- (E) None of these

42. A man pays a rent of Rs. 70 for the first day, Rs. 80 for the second day and so on, with the rent on each day being Rs. 10 more than the

rent on the previous day. What is the total rent paid for the first 20 days?

- (A) Rs. 2,300
- (B) Rs. 2,700
- (C) Rs. 3,000
- (D) Rs. 3,200
- (E) Rs. 3,300

43. In one day, what is the sum of the numbers on which the hour hand of a clock points each time the minute hand is on 12? (**Real NMAT Question**)

- (A) 12
- (B) 78
- (C) 156
- (D) 160
- (E) 178

44. Compute the expression below. $\sum_{k=2}^7 (2k - 1)$ (**Real NMAT Question**)

- (A) 35
- (B) 37
- (C) 39
- (D) 48
- (E) 63

45. For a cricket match team selection, 2 batsmen, 3 bowlers, and 1 wicketkeeper are to be picked. There are 23 players available to play as batsmen, 21 other players available to play as bowlers, and 9 other players available to play as wicketkeepers. If the maximum possible number of complete sets of 6 players are formed, how many of the available players will not be on a team?

- (A) 7
- (B) 9
- (C) 11

(D) 13

(E) 15

46. How many five-digit numbers can be formed using the digits 5, 6, 7, 2, 9, 0 if no digits can be repeated?

(A) 64

(B) 120

(C) 240

(D) 600

(E) 720

47. Five friends, Akshita, Binod, Chetan, Dravid, and Eshan are to be arranged in a line. How many such arrangements are possible if Binod is not allowed to stand next to Dravid?

(A) 24

(B) 48

(C) 72

(D) 96

(E) 120

48. How many 5 digit numbers can be formed using the digits 1, 2, 3, 4, 5 and 6 (without repetition) that are divisible by 8? (**Real NMAT Question**)

(A) 56

(B) 64

(C) 72

(D) 84

(E) 96

49. Among three different boxes, 10 identical balls have to be distributed. In how many ways can this be done such that every box has at least 2 balls?

(A) 15

(B) 16

- (C) 64
- (D) 81
- (E) None of these

50. There are 6 equally spaced points A, B, C, D, E and F marked on a circle whose radius is R. How many convex pentagons of distinctly different areas can be drawn using these points as vertices?

- (A) ${}^6P_5$
- (B) ${}^6C_5$
- (C) 5
- (D) 1
- (E) 6

51. One of the management test papers comprises of 9 questions divided equally among three sections, namely section I, section II and section III. There are fifteen different questions available such that there are five questions for every section for designing the test. If no two sections bear a common question, then how many different tests can be designed?

- (A) 480
- (B) 640
- (C) 800
- (D) 880
- (E) 1000

52. A shop sells 5 different types of sweets. In how many different ways a total of 8 sweets can be purchased?

- (A) 125
- (B) 495
- (C) 795
- (D) 840
- (E) 930

53. A box contains 90 balls of different colours: 13 yellow, 19 green, 27 red, 10 black, 7 brown and 14 white. Find the smallest number V such that any V balls drawn from the box will contain at least 14 balls of the same colour.
- (A) 69
 - (B) 70
 - (C) 72
 - (D) 76
 - (E) 79
54. Salim has total 9 friends, 5 girls and 4 boys. In how many ways can Salim invite them for his birthday party, if there have to be exactly 3 girls in the invitees list?
- (A) 80
 - (B) 160
 - (C) 200
 - (D) 240
 - (E) 320
55. There are 12 holes made in the ground. At least 3 are to be filled with a red ball and the other holes can be filled with any colour ball. In how many different ways can all the holes be filled from a box of 5 red balls and 10 mixed colour balls? (**Real NMAT Question**)
- (A) 345
 - (B) 425
 - (C) 445
 - (D) 465
 - (E) 485
56. How many arrangements of the word ABOVE are possible such that O is always in the middle? (**Real NMAT Question**)
- (A) 4
 - (B) 8
 - (C) 12

(D) 24

(E) 48

Directions for Questions 57–59: The following table represent the number of players nominated for different cricket teams.

Team	Total Player nominated	Batsmen	Bowler	All rounder
A	20	8	6	6
B	15	10	4	1
C	18	12	3	3

57. In how many ways can a team selector select 6 batsmen from team A?

(A) 18

(B) 20

(C) 24

(D) 28

(E) 30

58. In how many ways a team selector can select 10 players in team B where 6 are bats men, 3 are bowlers and 1 is an all-rounder?

(A) 720

(B) 800

(C) 840

(D) 900

(E) None of these

59. In how many ways a team selector can select 11 players in team C where 8 are bats men, 2 are bowlers and 1 is an all-rounder?

(A) 4455

(B) 4545

(C) 4465

(D) 4475

(E) None of these

- 60.** Each factor of 210 is written on a piece of paper, and all the pieces of paper are mixed up. If a piece of paper is randomly picked up from this mix, what is the probability that a multiple of 42 is written on the paper?

(A) $\frac{1}{16}$

(B) $\frac{5}{42}$

(C) $\frac{1}{8}$

(D) $\frac{3}{16}$

(E) $\frac{1}{4}$

- 61.** As per a weather forecast, the probability of hail is $\frac{1}{6}$ for any given day next week. What is the chance that there will be hail on both Thursday and Friday?

(A) $\frac{1}{36}$

(B) $\frac{1}{12}$

(C) $\frac{1}{6}$

(D) $\frac{1}{3}$

(E) $\frac{2}{3}$

- 62.** A classroom has 12 girls and 20 boys. $\frac{1}{4}$ of the girls in the class have cell phones. If a child is selected at random from the class, what is the probability that she is a girl who does not have a cell phone?

(A) $\frac{3}{32}$

(B) $\frac{9}{32}$

(C) $\frac{3}{8}$

- (D) $\frac{23}{32}$
- (E) $\frac{29}{32}$

63. A cube has sides numbered 1 through 6. If the cube is rolled three times, what is the probability that at least one of the rolls will result in a number higher than 4?

- (A) $\frac{13}{19}$
- (B) $\frac{11}{13}$
- (C) $\frac{14}{19}$
- (D) $\frac{19}{27}$
- (E) $\frac{12}{31}$

64. There is an 80% chance that Deeksha will skip her lunch and 25% chance that there will be a power failure. If these events are independent, what is the probability that Deeksha will skip her lunch OR that there will be a power failure?

- (A) 20%
- (B) 80%
- (C) 85%
- (D) 95%
- (E) 105%

65. Bag A contains 3 white and 3 red beads. Bag B contains 6 white and 3 red beads. One of the two bags will be chosen at random, and then two beads will be drawn from that bag at random without replacement. What is the probability that the two beads drawn will be of the same colour?

- (A) $\frac{7}{20}$
- (B) $\frac{9}{10}$
- (C) $\frac{9}{20}$

- (D) $\frac{11}{20}$
- (E) $\frac{13}{20}$

66. Two different unbiased dice are rolled together. What is the probability of getting a sum of more than or equal to 10 after adding the numbers shown on the tops of both the dice?

- (A) $\frac{1}{12}$
- (B) $\frac{1}{9}$
- (C) $\frac{1}{6}$
- (D) $\frac{2}{16}$
- (E) $\frac{1}{4}$

67. Two apples and five bananas are defective out of 10 apples and 20 bananas contained in a fruit basket. If Sanjeev takes out two fruits at random, what is the probability that either both are bananas, or both are good?

- (A) $\frac{119}{435}$
- (B) $\frac{338}{435}$
- (C) $\frac{841}{870}$
- (D) $\frac{217}{870}$
- (E) None of these

68. If 'M' and 'N' are two independent events and $P(M) = 0.5$ and $P(N) = 0.4$, find $P(M/N)$.

- (A) 0.4
- (B) 0.5
- (C) 0.6
- (D) 0.74
- (E) 0.88

69. The roll numbers of students in the class are in the range from 100 to 199 (both inclusive). If the teacher selects one student at random, what is the probability that his/her roll number is divisible by 3?

(A) $\frac{1}{5}$

(B) $\frac{32}{99}$

(C) $\frac{33}{100}$

(D) $\frac{2}{3}$

(E) None of these

70. An integer x is chosen at random from the numbers 1 to 50. Find the probability that $x + \frac{336}{x} \leq 50$.

(A) $\frac{7}{10}$

(B) $\frac{17}{25}$

(C) $\frac{19}{50}$

(D) $\frac{13}{50}$

(E) $\frac{3}{10}$

4 DI-Caselets and Tables

Directions for Questions 1–4: The table below* shows the information about number of laptops (figures in 1000s) of different models produced and rejected by a company over six years.

Number of laptops of different models produced and rejected by a company over the years (figures in 1000s)

Laptop model	P		Q		R		S		T	
Year	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected
2010	20	2	50	3	15	0.5	80	5	60	4
2011	35	3	45	2	20	0.55	75	4	58	4
2012	15	0.5	40	2.5	17	0.7	58	2	62	3.5
2013	25	0.25	42	2.3	25	1.5	65	3	40	1.5
2014	30	1.5	48	2.5	30	2	68	3	45	2
2015	27	1.5	41	2.1	26	1.75	72	3.5	50	2.3

*Table for Questions 1–4.

1. In case of Type Q laptop, in which year was the ratio of rejection to production the highest among the given years?
(A) 2010
(B) 2011
(C) 2012
(D) 2014
(E) 2015
2. In which year was the ratio of rejection to production the lowest among the given years for type T laptop?
(A) 2010
(B) 2012
(C) 2013
(D) 2014
(E) 2015
3. What was the difference in Type R laptops rejected between 2011 and 2012?

- (A) 150
- (B) 200
- (C) 250
- (D) 2000
- (E) 2400

4. The acceptable (not rejected) Type T laptops in 2012 were what percentage of those in 2011?

- (A) 8
- (B) 14
- (C) 106
- (D) 108
- (E) 110

Directions for Questions 5–8: Refer to the following table and answer the questions that follow:

Number of trousers produced by 5 factories over 5 months of 2016.

Month	Prisma	Shelby	Kooper	Wendy	Caret
Jan	900	850	350	1000	850
Feb	800	700	1050	1100	850
Mar	1050	800	1000	1100	950
Apr	800	850	850	1100	850
May	950	900	1050	1150	850
Total	4500	4100	4300	5450	4350

5. For which factory was the number of trousers manufactured in March the highest percentage of the total number of trousers produced by that factory during the five-month period?

- (A) Prisma
- (B) Shelby
- (C) Kooper
- (D) Wendy
- (E) Caret

6. The number of trousers manufactured by Wendy in April is what percentage of the number of trousers manufactured by Wendy in January?
- (A) 10%
 - (B) 91%
 - (C) 110%
 - (D) 115%
 - (E) 125%
7. Which of the five factories has the highest ratio of the number of trousers manufactured in April to number of trousers manufactured in February?
- (A) Prisma
 - (B) Shelby
 - (C) Kooper
 - (D) Wendy
 - (E) Caret
8. For which factory was the number of trousers manufactured in February and March together the lowest among the five factories?
- (A) Caret
 - (B) Wendy
 - (C) Kooper
 - (D) Shelby
 - (E) Prisma

Directions for Questions 9–12: Answer the questions on the basis of the information given below.

The table given below* shows the number of two-wheelers (motorised) running on the roads of a country XYZ during the period 2006 – 2010. These are the only type of two-wheelers on the roads of the country.

	2006	2007	2008	2009	2010
VTS	1120	1300	1800	1900	2100
SULPAR	194830	249200	266000	325000	438200
SCHAPE	35600	42300	43300	49200	57000
RHONDA	417500	479200	403400	416700	471000
MAHA	143600	172600	150400	162400	193800
SICTOR	1100	1600	2300	3000	2400
MUZUKI	114500	137600	121700	125700	158000
BAJAZ	58800	65000	64900	68000	80400
SLOGAN	12400	14400	15000	16500	21000

*Table for Questions 9–12.

9. The second highest annual growth over the entire period has been experienced by which of the following two-wheelers:
 - (A) RHONDA
 - (B) SICTOR
 - (C) VTS
 - (D) SCHAPE
 - (E) BAJAZ
10. What is the difference between the total numbers of two-wheelers on the roads of the country from the year 2007 to year 2009?
 - (A) 4900
 - (B) 4500
 - (C) 5100
 - (D) 5200
 - (E) 5400
11. What is the approximate percentage of RHONDA two-wheelers out of the total number of two-wheelers on the roads of the country in the year 2008?
 - (A) 30%
 - (B) 33.33%
 - (C) 35%

(D) 38%

(E) 45%

12. What is the average number of two-wheelers running on the roads of the country in the year 2008?

(A) 118756

(B) 118765

(C) 119576

(D) 181756

(E) 191756

Directions for Questions 13–15: Read the information given below* and answer the questions that follow.

The table given at the bottom of this page depicts the marks obtained by 1000 students in English and Computer Science in an entrance exam conducted by JET (Junior Entrance Test)

13. What is the difference between the percentage of students who secured more than 60% marks in aggregate and those who secured more than 40% marks in aggregate?

(A) 0%

(B) 27%

(C) 46%

(D) 54%

(E) 73%

14. What is the total number of students securing more than 20 marks in English and 40 marks in Computer Science?

(A) 40

(B) 70

(C) 260

(D) 840

(E) Cannot be determined

15. The percentage of the number of students securing more than 60% marks in Computer Science is approximately what percent of those getting more than 40% marks in aggregate?
- (A) 20%
- (B) 29%
- (C) 31%
- (D) 36%
- (E) 42%

Directions for Questions 16–19: Use the table to solve the question.

The following table gives the sales of various sections of three departmental stores that began operations in 2005. All values are in million dollars. (**Real NMAT Question**)

	2005	2006	2007	2008	2009
Topper's Top					
Men	13.5	12.5	9.8	11.5	12.5
Women	14.5	8.8	12.2	16.2	18.7
Others	21.2	16.2	25.6	21.7	25.2
Olivestyle					
Men	21.5	18.5	17.2	18.5	15.4
Women	8.2	9.5	10.8	11.5	12.7
Others	16.5	28.5	21.5	22.7	21.5
Eastside					
Men	4.3	5.4	8.6	11.2	9.5
Women	6.5	7.5	9.2	10.8	11.8
Others	6.5	7.2	6.8	6.5	7.5
Total Sales	112.7	114.1	121.7	130.6	134.8

16. For which year did the sales increase the most, relative to the previous year, for the men's section of Olivestyle?
- (A) 2005
- (B) 2006
- (C) 2007
- (D) 2008

(E) 2009

Subject \ Marks out of 50	>40	>30	>20	>10	>0
English	90	320	800	920	1000
Computer Science	40	210	660	810	1000
Average marks per subject	70	270	730	870	1000

*Table for Questions 13–15.

17. Which of the following represents the years during which the total sales of men's sections of the three departmental stores lay between 30% and 40% of the total sales of all the sections for the three stores?
- (A) 2005 and 2006
(B) 2005 and 2007
(C) 2005, 2006 and 2007
(D) 2005, 2006 and 2008
(E) 2006, 2008 and 2009
18. The highest percentage growth in the sales of all three stores together, relative to the previous year, was achieved in:
- (A) 2005
(B) 2006
(C) 2007
(D) 2008
(E) 2009
19. Which one of the following statements is correct?
- (A) The 'Others' section has contributed to more than 50% of sales for Topper's Top across all years.
(B) Between 2006 and 2009, sales of the women's section of Topper's Top declined steadily whereas that of the 'Others' section steadily increased.
(C) The men's section sales at Oliveside are always the lowest among all three stores.

- (D) The women's section sales at Eastside have always been higher than the average sales of all three sections at Eastside.
- (E) The 'Others' section sales of Eastside are always the highest among all three stores.

Directions for Questions 20–23: Table 1 shows the number of Science and Engineering doctorates from different countries between 1989 and 1993. Table 2 shows the number of only Engineering doctorates from the same countries for the same period of time. Go through the given tables and solve the questions based on them. **(Real NMAT Question)**

Table 1: Science and Engineering Doctorates

Field/ Year of Doctorate	Asia	China	India	Japan	South Korea	Taiwan
1989	10,035	1,024	4,209	3,561	984	257
1991	10,871	1,198	4,294	3,874	1,135	370
1993	12,587	1,895	4,320	4,438	1,421	513

Table 2: Engineering Doctorates

Field/ Year of Doctorate	Asia	China	India	Japan	South Korea	Taiwan
1989	3,621	726	586	1,774	415	120
1991	4,100	767	629	2,029	466	209
1993	4,700	1,069	323	2,362	659	287

20. What was the approximate percentage increase in the number of Science doctorates from India between 1989 and 1991?
- (A) 1.16%
- (B) 2.00%
- (C) 7.33%
- (D) 42.00%
- (E) 43.00%
21. In 1993, what percentage of the Science doctorates from Asia were from India?
- (A) 6.87%

- (B) 34.32%
- (C) 37.34%
- (D) 50.67%
- (E) 62.65%

22. The table shows the number of only Engineering doctorates from the same countries in 2003.

Field/ Year of Doctorate	Asia	China	India	Japan	South Korea	Taiwan
2003	NA	6,573	779	3,921	1,868	656

Which country recorded the least percentage increase in the number of engineering doctorates from 1989 to 2003?

- (A) India
 - (B) China
 - (C) Japan
 - (D) Taiwan
 - (E) South Korea
- 23.** From 1989 to 1993 what percentage of Engineering doctorates from Asia were from countries other than India?
- (A) 12.39%
 - (B) 16.18%
 - (C) 50.36%
 - (D) 61.71%
 - (E) 88.91%

Directions for Questions 24–27: In the Copa America league, four football teams namely, Brazil, Argentina, Uruguay and Paraguay, take part where each team is to play against the other three teams at most once. For a win, a draw and a loss, 2 points, 1 point and 0 points are awarded respectively. After several matches have been played in the league, a table is compiled which gives information about the points earned by teams at this stage in the league. **(Real NMAT Question)**

Teams	Points
Brazil	
Argentina	5
Uruguay	2
Paraguay	0

It is also known that Uruguay has not won any matches so far. Brazil has scored the same number of goals as other teams have scored against it. Paraguay has lost at least one match. The total points of Brazil are not known.

24. How many matches have resulted in a draw so far?
 - (A) 0
 - (B) 1
 - (C) 2
 - (D) 3
 - (E) 4
25. How many teams have played matches against every other team?
 - (A) 0
 - (B) 1
 - (C) 2
 - (D) 3
 - (E) 4
26. How many points were scored by Brazil?
 - (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) 5
27. What is the difference between the number of drawn matches played by Brazil and Argentina?

- (A) 0
- (B) 1
- (C) 2
- (D) 0 or 1
- (E) 0 or 2

Directions for Questions 28–30: Read the information given below and answer the questions that follow.

The table below* depicts the number of students of five engineering colleges A, B, C, D and E who were placed in different companies during campus placement drives.

- 28.** What is the approximate percentage of students of college C who got selected during campus placement drives?
- (A) 45%
 - (B) 50%
 - (C) 55%
 - (D) 60%
 - (E) 65%

Colleges	Mechanical Engineering		Electrical Engineering		Electronics Engineering	
	Total Students	Selected	Total Students	Selected	Total Students	Selected
A	60	40	60	24	50	15
B	60	30	60	36	50	35
C	60	24	60	30	50	40
D	60	35	60	18	50	25
E	60	18	60	12	50	42

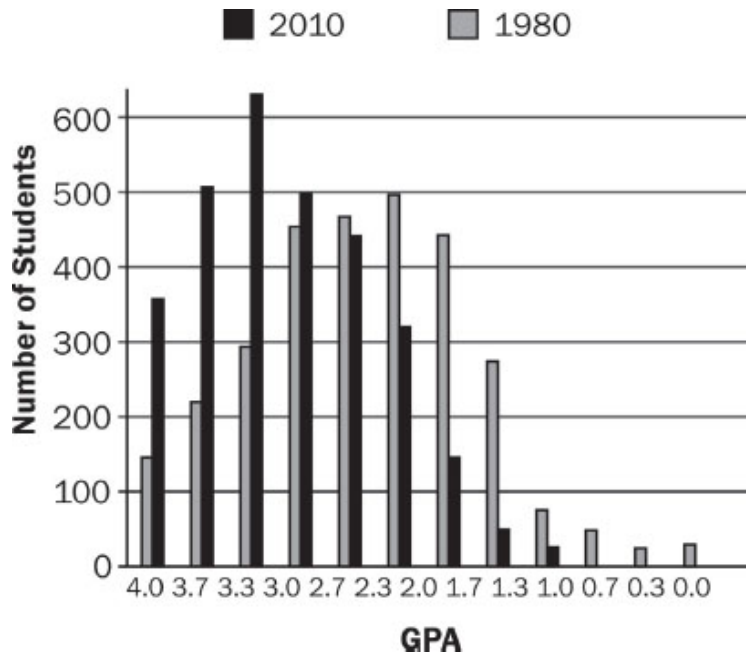
*Table for Questions 28–30.

- 29.** What is the percentage of Mechanical Engineering students from all the colleges who got selected during campus placement drives?
- (A) 40%
 - (B) 44%
 - (C) 49%
 - (D) 51%
 - (E) 53%

- 30.** What is the total number of students of Electrical Engineering from all the colleges who got selected during campus placement drives?
- (A) 100
 - (B) 110
 - (C) 120
 - (D) 130
 - (E) 136

5 DI-Graphs and Charts

Directions for Questions 1–4: Refer to the following graph and answer the questions.



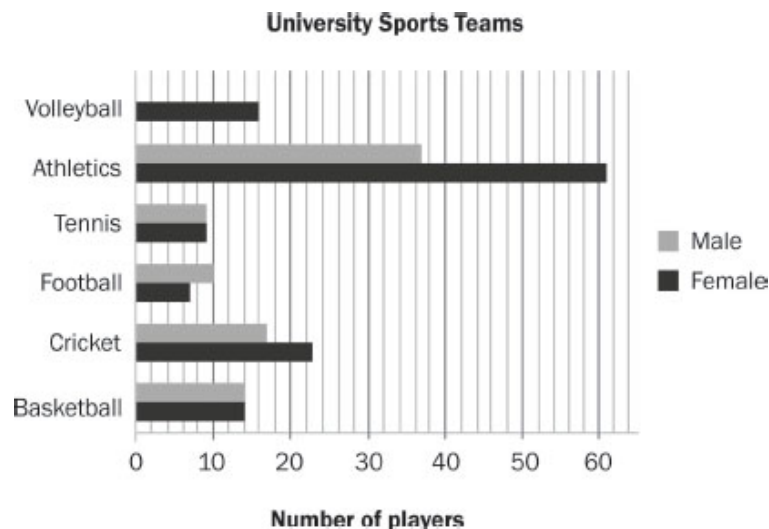
Comparison of GPAs of 3000 students in 1980 and in 2010

1. What was the mode for the GPA among the 3,000 students in 2010?
(A) 3.7
(B) 3.3
(C) 3.0
(D) 2.7
(E) 2.3
2. What was the median GPA among the 3,000 students in 1980?
(A) 3.7
(B) 3.3
(C) 3.0
(D) 2.7

(E) 2.3

3. Approximately what percentage of the students in 2010 earned at least a 3.0 GPA?
- (A) 25%
- (B) 50%
- (C) 67%
- (D) 80%
- (E) 97.5%
4. Approximately what percentage of the students in 1980 earned a GPA less than 3.0?
- (A) 33%
- (B) 37.5%
- (C) 50%
- (D) 62.5%
- (E) 75%

Directions for Questions 5–8: Go through the given graph and solve the questions based on it.



5. What is the ratio of male players to female players on the Athletics team?

- (A) 37 : 61
- (B) 9 : 17
- (C) 16 : 23
- (D) 14 : 19
- (E) 61 : 37

6. All players, except those in Athletics and Cricket teams, are a part of only one team. If there are a total of 76 male players in different university sports teams, how many male players are in both Athletics team and Cricket team?

- (A) 11
- (B) 17
- (C) 37
- (D) 54
- (E) 76

7. In which of the following university sports team(s) do male players outnumber female players?

- (A) Athletics, Tennis and Football
- (B) Cricket
- (C) Football and Cricket
- (D) Football
- (E) Tennis and Athletics

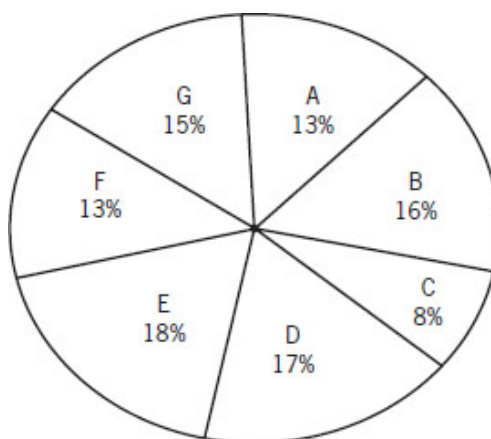
8. What is the ratio of female tennis players to male basketball players on the university sports teams?

- (A) 5 : 14
- (B) 9 : 14
- (C) 7 : 18
- (D) 14 : 9
- (E) 18 : 7

Directions for Questions 9–12: Study the following chart to answer the question given below:

Town	% of the population below the poverty line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Percentage distribution of the population of seven towns of the state in 2005.



9. In 2006, the populations of Town A and Town B each increased by 10% as compared to 2005. If the population of Town A in 2005 was 5000 and the percentage of the population living below the poverty line for all seven towns in 2006 remains the same as in 2005, which of the following is the approximate population of Town B below the poverty line in 2006?
- (A) 2500
(B) 3000
(C) 3500
(D) 4000
(E) 4500

10. In 2007, the population of Town D increased by 10% as compared to 2005 and the population of Town G reduced by 5% as compared to 2005. If the population of Town G in 2005 was 9000, what is the total population of Towns D and G in 2007?
- (A) 19200
 - (B) 19770
 - (C) 19870
 - (D) 19970
 - (E) None of these
11. If in 2005 the total population of the seven towns together was approximately 55,000, what will be the approximate population of Town F in that year below the poverty line.
- (A) 2500
 - (B) 3000
 - (C) 3500
 - (D) 4000
 - (E) 4500
12. The population of Town C is 2000 in 2005. What will be the ratio of the population of Town C below the poverty line to that of Town E below the poverty line in that year?
- (A) 207 : 76
 - (B) 76 : 207
 - (C) 152 : 207
 - (D) 76 : 307
 - (E) 87 : 207

Directions for Questions 13–16: Go through the given graphs and solve the questions based on them. (*Real NMAT Question*)

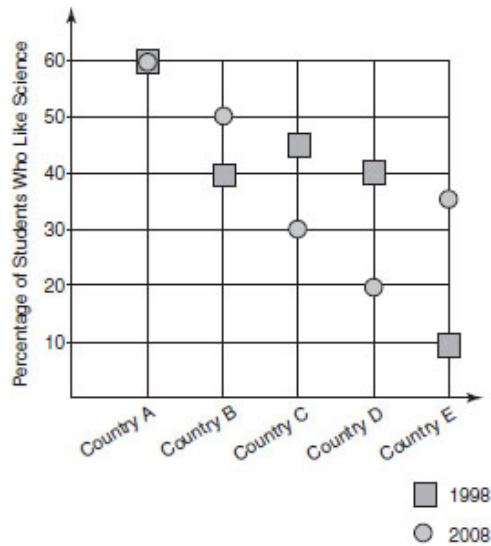


Figure 1

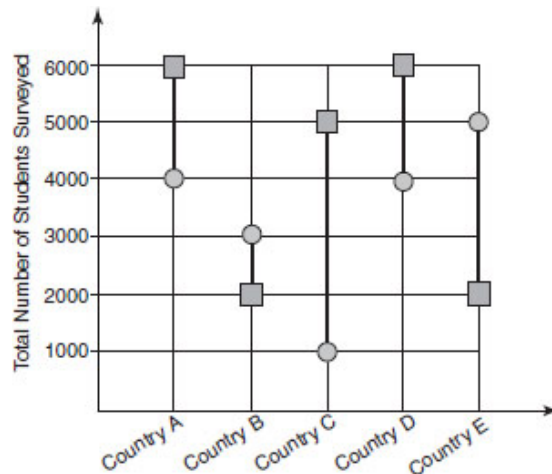


Figure 2

13. In 2010, the total number of students surveyed in the five countries who liked science was 8,450. Which statement is true about the total number of students surveyed in the five countries who liked science?
- (A) It remained the same between 1998 and 2008 but changed between 2008 and 2010.
 - (B) It increased by 13.05% between 1998 and 2008 but decreased by 15.03% between 2008 and 2010.
 - (C) It decreased by 13.05% between 1998 and 2008 but increased by 15.03% between 2008 and 2010.

- (D) It increased by 27.03% between 1998 and 2008 but decreased by 25.19% between 2008 and 2010.
- (E) It decreased by 27.03% between 1998 and 2008 but increased by 25.19% between 2008 and 2010.

14. In the year 2000, the total number of students surveyed in the five countries who liked science was 10% more than the total number of students surveyed in the five countries in 1998 who did not like science. Out of the total number of students surveyed in the five countries who liked science in the year 2000, there were 2,000 students who liked only physics but not chemistry and biology, 4,346 students who liked only chemistry but not physics and biology and 5,579 students who liked biology. How many students surveyed in the five countries who liked science in the year 2000 did not like biology but liked both physics and chemistry?

- (A) 925
- (B) 1,000
- (C) 1,320
- (D) 2,425
- (E) 2,835

15. In 2010, this survey was conducted in Country F. The number of students of Country F who participated in the survey was equal to the difference between the number of students surveyed in countries A, B, C, D and E who liked science in 2008 and the number of students surveyed in countries A, B, C, D and E who liked science in 1998. What was the sample size of the survey conducted in Country F in the year 2010?

- (A) 2,500
- (B) 4,250
- (C) 5,500
- (D) 6,750
- (E) 9,250

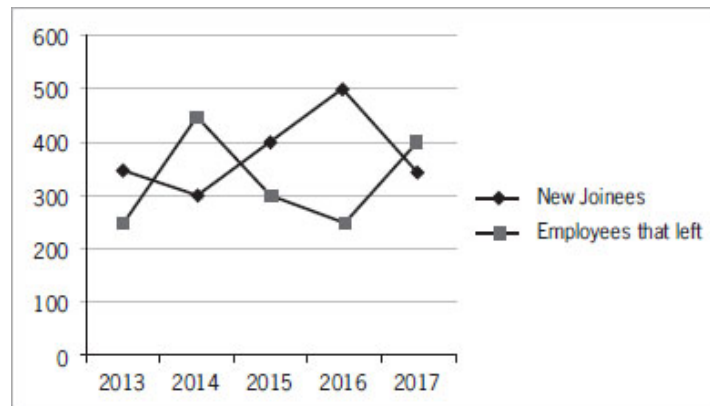
16. All the countries which recorded a percentage change of less than 50% in the number of students who liked science from 1998 to 2008,

were surveyed for a second time in 2008 to verify the results. When the same population was surveyed for a second time for those countries, it was found that the data was 900 more than the actual value for 2008. What was the percentage error in plotting the value for 2008?

- (A) 50%
- (B) 60%
- (C) 75%
- (D) 85%
- (E) 90%

Directions for Questions 17–19: Answer the questions on the basis of the information given below.

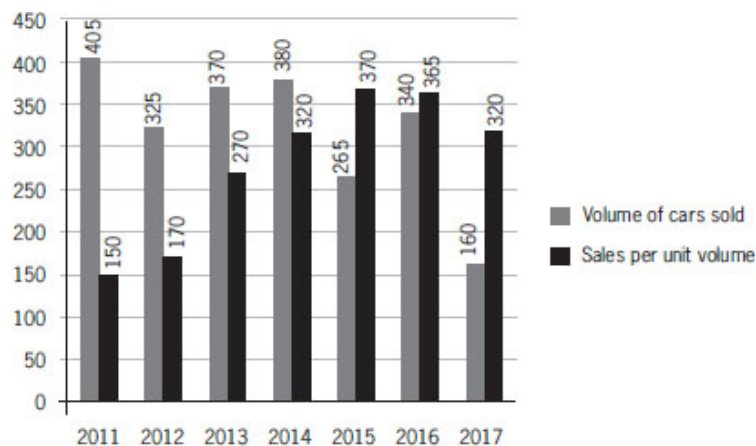
The line graph below depicts the number of employees who left the company ABC Pvt. Ltd. and the number of new joiners in that year. Also, it is known that the number of employees in the year 2012 was 2000.



17. What was the percentage change in number of employees in the company from the year 2012 to year 2013?
- (A) 2%
 - (B) 3%
 - (C) 4%
 - (D) 5%
 - (E) Data insufficient

18. In which of the following years was the number of employees in ABC Pvt. Ltd. the maximum?
- (A) 2014
(B) 2015
(C) 2016
(D) 2017
(E) None of these
19. In which of the following two years was the number of employees in ABC Pvt. Ltd. the same?
- (A) 2013 and 2017
(B) 2013 and 2015
(C) 2016 and 2017
(D) 2014 and 2017
(E) None of these

Directions for Questions 20–22: Answer the questions on the basis of the information given below.



The bar chart represents the volume of cars sold in a particular year and the sales per unit volume of a particular year.

20. By what percentage is the total volume of sales in the year 2015 greater/smaller than that in 2011?
- (A) 45.6%

- (B) 50.3%
- (C) 54.2%
- (D) 61.4%
- (E) 66.67%

21. What is the difference between the average of the volume of cars sold and that of the sales per unit volume for the whole period?

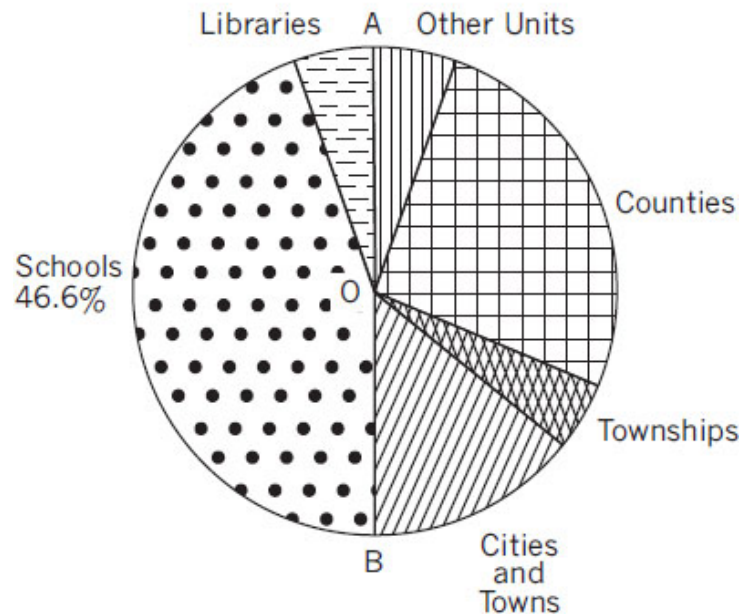
- (A) 40.00
- (B) 41.57
- (C) 43.21
- (D) 45.12
- (E) 50.73

22. In how many of the years, the trend is such that when there is an increase in volume sold over the previous year, then there is a decrease in the sales per unit volume over the previous year and vice versa?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

Directions for Questions 23–26: The given graph shows the distribution of a net property tax of 16.6 million dollars levied by a district government. Go through the given graph and solve the questions based on it. (**Real NMAT Question**)

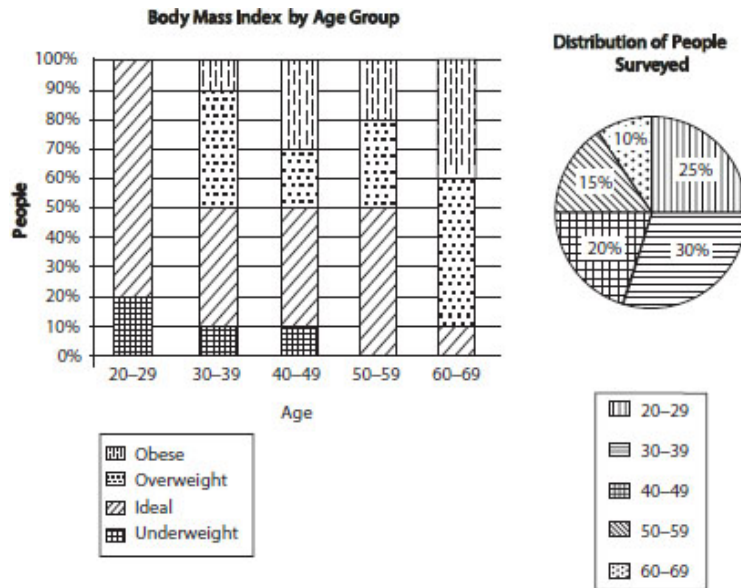
Distribution of Property Tax



23. If points A, O, and B can be joined to form a straight line, what was the property tax levied by the government on Libraries?
- (A) 3,40,000 dollars
 - (B) 4,88,235 dollars
 - (C) 5,64,400 dollars
 - (D) 16,60,000 dollars
 - (E) 18,30,000 dollars
24. The tax levied on Schools, Libraries, and Counties was 75% of the total tax levied. The total tax levied on Townships and Cities and Towns was 3.652 million dollars. What was the tax levied on Other Units?
- (A) 4,98,000 dollars
 - (B) 5,15,000 dollars
 - (C) 8,30,000 dollars
 - (D) 12,45,000 dollars
 - (E) 16,60,000 dollars

25. The combined tax levied on Townships, Cities and Towns, and Other Units was equal to the tax levied on Counties. The tax levied on Counties was half the combined tax levied on Schools and Libraries. How much tax was levied on Counties?
- (A) 25,00,000 dollars
 - (B) 27,50,000 dollars
 - (C) 32,60,000 dollars
 - (D) 41,50,000 dollars
 - (E) 83,00,000 dollars
26. The tax levied on Cities and Towns was 6 times the tax levied on Other Units and 4.5 times the tax levied on Townships. If the tax levied on Other Units was 4,98,000 dollars, what per cent of the total taxes was levied on Townships?
- (A) 3%
 - (B) 4%
 - (C) 13.5%
 - (D) 18%
 - (E) 20%

Directions for Questions 27–30: A survey on Body Mass Index was conducted on a group of 2,000 people of different age groups. The first graph shows the Body Mass index of different age groups. The second graph shows the distribution of age groups of the people who took the survey. Go through the given graphs and solve the questions based on them. (*Real NMAT Question*)



27. How many people who were 50 years and above had an ideal body mass index?
- (A) 60
(B) 170
(C) 200
(D) 500
(E) 1,200
28. How many people below 40 years did not have an ideal body mass index?
- (A) 460
(B) 640
(C) 900
(D) 1,100
(E) 1,600
29. What percent of people who took the survey were obese?
- (A) 10%
(B) 16%
(C) 25%
(D) 42%

(E) 100%

30. Of the total number of overweight people, what percent was in the age group of 50 – 59?

(A) 4.50%

(B) 17.65%

(C) 21.42%

(D) 30.00%

(E) 45.00%

6 Data Sufficiency

Directions for Questions 1 to 30: A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
 - (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
 - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
 - (D) EACH statement ALONE is sufficient.
 - (E) Statements (1) and (2) TOGETHER are NOT sufficient.
1. What are the values of 3 integers a, b and c? (**Real NMAT Question**)
 - (1) $ab = 8$
 - (2) $bc = 9$
 2. What is the value of Q? (**Real NMAT Question**)
 - (1) Ratio of P and Q is 3:5, where P is positive.
 - (2) Ratio of P and Q is $\frac{6}{20}$ where Q is positive.
 3. What percentage of a group of people are men with MBA degrees?
 - (1) Of all the men in the group, 25% have MBA degrees.
 - (2) Of all the women in the group, 30% have MBA degrees.
 4. In a classroom, one student is to be selected at random to solve a question. What is the probability that a girl will be selected?
 - (1) Two-fifths of the students in the classroom are boys.
 - (2) 15 of the students in the classroom are boys.
 5. Find the average speed of tiger 'x'. (**Real NMAT Question**)

- (1) Initially tiger 'x' covers some part of the distance at 57 m/s.
 - (2) Tiger 'x' covers the remaining part of the distance at 43 m/s.
6. If a is an integer, is $a + 1$ even?
- (1) $a + 2$ is an even integer.
 - (2) $a - 1$ is an odd integer.
7. If Udit saved Rs. 1200 of his earnings last month, how much did Udit earn last month?
- (1) Udit spent $\frac{1}{2}$ of his earnings last month on household expenses and saved $\frac{1}{4}$ of the remainder.
 - (2) Of his earnings last month, Udit paid twice as much in rent as he saved.
8. Water is pumped into a partially filled swimming pool at a constant rate through an inlet pipe. At the same time, water is pumped out of the pool at a constant rate through an outlet pipe. At what rate, in litres per minute, is the amount of water in the pool increasing?
- (1) The amount of water initially in the pool is 500 litres.
 - (2) Water is pumped into the pool at a rate of 50 litres per minute and out of the pool at a rate of 20 litres every 4 minutes.
9. What is the price of tea?
- (1) The price of coffee is Rs. 5 more than that of tea.
 - (2) The price of coffee was Rs. 5 less than the price of a cold drink, which cost three times the price of tea.
10. What is the cube root of y ?
- (1) The 7th root of y is 12.
 - (2) The 22nd root of y is 2.
11. In triangle ABC, if $AB = x$ units, $BC = x + 4$ units, and $AC = y$ units, which of the three vertex angles of triangle ABC has the greatest degree measure?
- (1) $y = x + 8$

(2) $x = 4$

12. What percentage of Debating club members enrolled at a certain school are from India?
- (1) Of the Indian students enrolled at the school, 20% are members of the Debating club.
 - (2) Of the non-Indian students enrolled at the school, 45% are members of the Debating club.
13. If the sequence S has 150 terms, what is the 121st term of S ?
- (1) The first term of S is 32.
 - (2) The 138th term of S is 1248, and each term of S after the first is 18 more than the preceding term.
14. What is the selling price of the mixture if the ratio of the two qualities of tea mixed is 3:4? (**Real NMAT Question**)
- (1) Cost price of the first quality of tea is Rs. 180 per kg.
 - (2) Cost price of the second quality of tea is Rs. 225 per kg.
15. What is the area of the quadrilateral? (**Real NMAT Question**)
- (1) The co-ordinates of the vertices are (1, 5), (2, 3), (5, 4) and (4, 7).
 - (2) The intersection of its diagonals is at the origin.
16. The absolute difference between a two digit number and the number formed by reversing the digits of that number is D. What is the number?
- (1) $D = 36$
 - (2) The sum of the digits of the number is 12.
17. Who is the shortest among the five friends A, B, D, E and F?
- (1) D is taller than F but shorter than A and F is not the shortest.
 - (2) E is shorter than B.
18. If a, b and c are digits, is $(a + b + c)$ a multiple of 9? (A digit can be one of the integers 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.)

- (1) The three digit number abc is a multiple of 9.
- (2) $[(a \times b) + c]$ is a multiple of 9.
- 19.** What is the value of X , if X is an integer?
- (1) $X =$
- (2) $X^2 - 1 < 0$
- 20.** Is parallelogram $ABCD$ a rhombus?
- (1) The four triangle enclosed by the diagonals and the sides have equal areas.
- (2) A circle can be inscribed in $ABCD$ touching all the four sides.
- 21.** Is $a = b = c = 1$?
- (1) $a^2 + b^2 + c^2 = ab + bc + ca$
- (2) $a^2 + b^2 = 2c^2$
- 22.** Pipe A can fill a tank in 'a' hours and pipe B can fill the same tank in 'b' hours. If both the pipes are opened together for 2 hours, then what is the volume (in cc) of water in the tank after 2 hours?
- (1) $a = 6$ and $b = 8$
- (2) Volume of the tank is 100 cc
- 23.** Four lectures Arithmetic, Biology, Chemistry and Dermatology were scheduled, one on each day on four consecutive days, but not necessarily in that order. On which day was Chemistry scheduled?
- (1) The first lecture was scheduled on Monday, 14th January 2016 and was followed by Dermatology.
- (2) Arithmetic was not scheduled on 16th January 2016 and there was a gap of one day between Arithmetic and biology.
- 24.** Are the integers A and B co-primes? (**Real NMAT Question**)
- (1) The numbers A and B are the squares of two successive even numbers.
- (2) Both A and B are distinct primes.

25. Find the value of x . (*Real NMAT Question*)

Statements:

(1) $x = \sqrt{4096}$

(2) $x^{64} = 8^{128}$

26. What is the sum of 3 successive prime numbers? (*Real NMAT Question*)

(1) The 3 prime numbers are in arithmetic progression.

(2) The first of them is 5.

27. What is Mr Kashyap's salary? (*Real NMAT Question*)

(1) Mr Kashyap bought 50 kg rice with one-fourth of his salary.

(2) Had the rice been 20% cheaper than its current price, Mr Kashyap could have bought 50 kg rice for \$100 more than one-tenth of his salary.

28. Is $z > 1$? (*Real NMAT Question*)

(1) $\log z^x > \log z^{x^2}$ [x is an integer]

(2) $z^2 < z$

29. What is the probability of drawing a Rs. 5 coin from a bag containing 23 coins? (*Real NMAT Question*)

(1) Rs. 2 coins are 12 in number.

(2) Rs. 5 coins are 8 in number.

30. Find the value of $\frac{x^3}{y^2+1}$ (*Real NMAT Question*)

(1) $\frac{x^2}{y^2} = \frac{1}{4}$

(2) $\frac{x}{y} = \frac{1}{2}$

3.2 Answers and Explanations

The following discussion is intended to familiarise you with the most efficient and effective approaches to the kinds of problems common to quantitative skill questions. The particular questions in this chapter are generally representative of the kinds of problem-solving questions you will encounter on the NMAT exam. Remember that it is the problem-solving strategy that is important, not the specific answers or details of a particular question.

1 Number Properties

$$\begin{aligned}\sqrt{12} &= 2\sqrt{3} \\ 1. \quad \sqrt{60} &= 2\sqrt{15} \\ \sqrt{45} &= 3\sqrt{5}\end{aligned}$$

Thus, we get

$$\begin{aligned}\frac{2\sqrt{3}}{5} \times \frac{2\sqrt{15}}{2^4} \times \frac{3\sqrt{5}}{3^2} &= \frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^2} \times \frac{\sqrt{5}}{3^1} \\ &= \frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^2} \times \frac{\sqrt{5}}{3^1} = \frac{\sqrt{3}}{5} \times \frac{\sqrt{3}\sqrt{5}}{2^2} \times \frac{\sqrt{5}}{3} \\ &= \left(\frac{3 \times 5}{2^2 \times 3 \times 5} \right) = \frac{1}{4}\end{aligned}$$

The correct answer is C.

$$0.\bar{3} = 0.3333 = \frac{1}{3}$$

$$\text{Thus, } 0.00\bar{3} = \frac{1}{3} \times \frac{1}{100} = \frac{1}{300}$$

$$\begin{aligned}2. \quad \text{Thus, } 7.58\bar{3} &= 7.58 + 0.00\bar{3} \\ &= \frac{758}{100} + \frac{1}{300} \\ &= \frac{2275}{300} = \frac{91}{12}\end{aligned}$$

The correct answer is A.

3. $\frac{1}{3}$ of all the pencils is 5 pencils. These 5 pencils each cost Rs. 2, for a total of Rs. 10.

The remaining 10 pencils cost Rs. 5 each, for a total of Rs. 50.

If all of these more expensive pencils are lost, then the lost pencils represent $\frac{50}{60}$ of all the money paid.

$$\text{Thus, required \%} = \frac{50}{60} \times 100 = \text{approximately } 83\%$$

The correct answer is D.

4. The answer is the greatest common factor (GCF) of the two numbers.

$$\begin{aligned} 4,000 &= 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \\ &= 2^5 \times 5^3 \end{aligned}$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5 = 2^2 \times 3^2 \times 5$$

These numbers have $2 \times 2 \times 5$ in common, so 20 is the GCF.

The correct answer is C.

5. If t is divisible by 12, then t^2 must be divisible by 144 or $2 \times 2 \times 2 \times 2 \times 3 \times 3$. Therefore, t^2 can be divided evenly by 2 at least four times, so a must be at least 5.

The correct answer is C.

6. The key to solving this problem is realising that

$$5^{k+1} = 5^k 5^1$$

$$\text{Now, } 5^{k+1} = 2,000$$

$$5^k 5^1 = 2,000$$

Now divide both sides by 5:

$$5^k = 400$$

$$\text{So, } 5^k + 1 = 401$$

The correct answer is B.

7. Since a square root is the same as a $\frac{1}{2}$ exponent and a cube root is the same as a $\frac{1}{3}$ exponent.

Therefore, converting the given expression into fractional exponents, we get:

$$x^{\frac{1}{2}}x^{\frac{1}{3}} = x^{\frac{1}{2} + \frac{1}{3}} = x^{\left(\frac{3}{6} + \frac{2}{6}\right)} = x^{\frac{5}{6}} = \sqrt[6]{x^5}$$

The correct answer is E.

8. In order to answer this question, you have to understand what creates zeroes at the end of a number. You will notice that zeroes are created by 10's, each of which is created by one 2 and one 5. So to answer this question, you simply need to work out how many pairs of 2's and 5's are in the given expression

$$125^{14}48^8 = (5^3)^{14} \times (2^4 \times 3)^8 = 5^{42} \times 2^{32} \times 3^8$$

Even though there are 42 powers of 5, there are only 32 powers of 2, so you can only make 32 pairs of one 5 and one 2.

Therefore, the number of consecutive zeroes at the end = 32

The correct answer is B.

9. For three consecutive integers, the possibilities are [odd, even, odd] or [even, odd, even].

Since n could be an odd or an even, option (B) and (C) are eliminated.

Option (D) is true only if n is even, but not if n is odd, so option (D) is also eliminated.

In any set of three consecutive integers, one of the integers must be divisible by 3, but not necessarily n , so option (A) is also eliminated.

For the same reason, (E) must be true, as $n(n+1)(n+2)$ can be thought of as "the product of any three consecutive integers." Since one of these integers must be divisible by 3, the product of those three numbers must also be divisible by 3.

The correct answer is E.

10. Decimal placement can be determined by how many times a number is multiplied or divided by 10. Multiplying moves the decimal point to the right, and dividing moves the decimal point to the left. Look for powers of 10 in the given fraction, remembering that $10 = 2 \times 5$.

$$\begin{aligned}\frac{17}{2^{10}5^{13}} &= \frac{17}{2^{10}5^{10}5^3} = \frac{17}{(2 \times 5)^{10}5^3} \\ &= \frac{17}{10^{10}5^3} = \frac{17/125}{10^{10}} = \frac{0.136}{10^{10}}\end{aligned}$$

There is no zero to the right of the decimal point before the first non-zero digit in 0.136. However, dividing by 10^{10} will move the decimal to the left 10 places, resulting in 10 zeros between the decimal and the '136' part of the number.

The correct answer is A.

11. Note that $25 \times 4 = 100$, and the other side of the equation involves a power of 10. Separating out the 'pairs' of 25 and 4 on the left, we have:

$$25^5 4^6 = 10^x + a$$

$$4^1(4^5 25^5) = 10^x + a$$

$$4^1(100)^5 = 10^x + a$$

$$4(10^{10}) = 10^x + a$$

$$40,000,000,000 = [\text{a power of } 10] + a$$

To minimise 'a' while keeping it positive, maximise the power of 10 while keeping it less than $25^5 4^6$.

The greatest power of 10 that is less than 40,000,000,000 is 10,000,000,000, or 10^{10} .

Thus:

$$40,000,000,000 = 10,000,000,000 + a$$

$$30,000,000,000 = a$$

The correct answer is E.

12. The units digits of 7 to positive integers create a repeating pattern (this works for digits other than 7 also). By multiplying 7 by itself repeatedly in the calculator, you can generate the pattern:

$$7^1 = 7$$

$$7^2 = 49$$

$$7^3 = 343$$

$$7^4 = 2,401$$

$$7^5 = 16,807$$

$$7^6 = 117,649$$

$$7^7 = 823,543$$

$$7^8 = 5,764,801$$

Pattern: 7, 9, 3, 1

To find the 86th item in a pattern of 4 repeating items, find the remainder when 86 is divided by 4, that is, 2. The second element in the pattern is 9.

The correct answer is E.

13. Remember that when dealing with evenly spaced integers, the average is the middle value.

The sum of the even integers between 1 and 100 = $51 \times 50 = 2550$

The sum of the odd integers between 100 and 150 = $125 \times 25 = 3125$

The required difference = $2550 - 3125 = -575$

The correct answer is A.

14. The LCM of 12, 18, 30 and 45 is 180. Thus, the answer has to be 8 less than a multiple of 180.

$1080 - 8 = 1072$ is the only number that fits and should be the correct answer.

The correct answer is A.

15. For $n = 0$, $2^{2n+1} = 2^{0+1} = 2^1 = 2$

For $n = 1$, $2^{2n+1} = 2^{2+1} = 2^3 = 8$

For $n = 2$, $2^{2n+1} = 2^{4+1} = 2^5 = 32$

For $n = 3$, $2^{2n+1} = 2^{6+1} = 2^7 = 128$

For $n = 4$, $2^{2n+1} = 2^{8+1} = 2^9 = 512$

Therefore, the sum of the last digits of the above numbers = $2 + 8 + 2 + 8 + 2 = 22$

When 22 is divided by 7, it gives a remainder of 1.

The correct answer is A.

16. If a and b are odd prime numbers, then

$$a^2 + b^2 = \text{even number}$$

$$a + b + 1 = \text{odd number}$$

$$a^2 + b^2 - 1 = \text{odd number}$$

Therefore, the H.C.F. of these numbers will be 1.

Similarly for the case $a = b = 2$, the H.C.F. will be 1.

When only one of them is equal 2, it will again give the H.C.F. as 1.

Alternatively,

$a^2 + b^2 - 1$ and $a^2 + b^2$ are two consecutive positive integers, whose H.C.F. will always be equal to 1.

The correct answer is A.

17. The two digits at unit's place and ten's place can be only 2 or 3. So, the hundredth digit must be 6. So, the number is either 632 or 623. The difference between 623 and 326 is 297.

The correct answer is A.

18. Such questions can be solved easily on working with the answer choices.

Checking option (C), we get

$$\frac{24}{6} = 4 \text{ and } 24 \times 2 = 48$$

Digits when reversed, number is 42.

So, the difference is $(48 - 42) = 6$

The correct answer is C.

19. If we assume that any digit out of five digits is at fixed position, then the remaining four digits can be arranged in $4!$ (24) ways. So, each of the five digits will appear at each of the five places $4!$ (24) times.

So, the sum of the digits at each position is 24

$(1 + 3 + 5 + 7 + 9) = 600$ and hence the sum of all such numbers will be

$$= 600(1 + 10 + 100 + 1000 + 10000) = 6666600$$

The correct answer is A.

20. $180 = 2^2 \times 3^2 \times 5^1$

We know that for a number $N = a^p \times b^q \times c^r$, the number of factors of N is calculates as:

$$n = (p + 1) \times (q + 1) \times (r + 1)$$

Now, we should try to break-up 40 as a product of 3 factors. The only possible value of A satisfying all the given conditions is as below:

$$A = 2^4 \times 3^3 \times 5^1 \text{ (As } 5 \times 4 \times 2 = 40)$$

Therefore, the required value

$$\frac{A}{40} = \frac{2^4 \times 3^3 \times 5^1}{40} = 54$$

The correct answer is A.

21. For a number to be divisible by 3, the sum of all the digits should be divisible by 3.

Now, $5 + 2 + 3 + 7 + a + b$ should be divisible by 3.

$17 + a + b$ must be divisible by 3.

Therefore, $a + b$ must be a (multiple of 3) + 1.

That is, 1, 4, 7, 10, 13, 16, 19.

The correct answer is E.

22. 2A when divided by 9 will give a remainder of 2×7 , that is, 14. This can be divided by 9 and the required remainder will be 5.

The correct answer is C.

23. Let the total number of members be x^2 .

The, the number of members went for rock climbing = $\frac{x^2}{5}$

And, the number of members went for hiking = $2x$

The remaining members are = 10

Hence, $\left(\frac{x^2}{5}\right) + (2x) + 10 = x^2$

Solving the equation, we get:

$$x = 5, -\frac{3}{2}$$

Since number of members cannot be negative,

So, $x = 5$

So, number of members went for hiking

$$= 2 \times 5 = 10$$

The correct answer is B.

24.

$$\begin{aligned}& \frac{1}{3} \text{ of } \frac{2}{5} \{ (6 \times 3) - (3 \times 1) \} + \frac{1}{2} - \frac{1}{6} \\&= \frac{1}{3} \text{ of } \frac{2}{5} \{ 18 - 3 \} + \frac{1}{2} - \frac{1}{6} \\&= \frac{1}{3} \text{ of } \frac{2}{5} \times 15 + \frac{1}{2} - \frac{1}{6} \\&= 2 + \frac{1}{2} - \frac{1}{6} = \frac{24 + 6 - 2}{12} \\&= \frac{28}{12} = \frac{7}{3} = 2\frac{1}{3}\end{aligned}$$

The correct answer is C.

- 25.** We have to find the remainder when $1! + 2! + \dots + 600!$ is divided by 6.

From $3!$ (i.e., 6) onwards each number in the series will be divisible by 6.

Therefore, the remainder will occur only due to first two terms.

$$\text{Remainder} = 1! + 2! = 3$$

The correct answer is C.

- 26.** We have to find the digit in the unit place of the following:

$$(98^{43} \times 122^{22}) + 729^{59} + 2^{543}$$

The cyclicity of the digits present at the unit place of the numbers given in the expression are as below:

Cyclicity of 8 = 4 (8, 4, 2, 6)

Cyclicity of 2 = 4 (2, 4, 8, 6)

Cyclicity of 9 = 2 (9, 1)

Therefore, the given expressions can be written as below:

$$(98^{4 \times 10 + 3} \times 122^{4 \times 5 + 2}) + 729^{2 \times 29 + 1} + 2^{4 \times 135 + 3}$$

Hence, the unit place of the above expression,

$$= (8^3 \times 2^2) + 9^1 + 2^3$$

$$= (2 \times 4) + 9 + 8$$

$$= 8 + 9 + 8 = 5$$

The correct answer is A.

- 27.** The divisibility rule of 9 says that the sum of the digits must be divisible by 9.

So, checking the options one by one, we get:

Option A: $1 + 2 + 0 + 3 = 6 \rightarrow$ Not divisible

Option B: $2 + 2 + 5 + 6 = 15 \rightarrow$ Not divisible

Option C: $4 + 2 + 6 + 5 + 1 = 18 \rightarrow$ Divisible

Option D: $7 + 1 + 6 + 2 + 3 = 19 \rightarrow$ Not divisible

Option E: $9 + 2 + 4 + 2 + 3 = 20 \rightarrow$ Not divisible

The correct answer is C.

- 28.** We have to find the LCM of ${}^nC_1$ and ${}^nC_2$, where n is odd

We know that,

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

Therefore,

$${}^nC_1 = \frac{n!}{1!(n-1)!} = \frac{n(n-1)!}{1!(n-1)!} = n$$

And,

$${}^nC_2 = \frac{n!}{2!(n-2)!}$$

$$= \frac{n(n-1)(n-2)!}{2!(n-2)!} = \frac{n(n-1)}{2}$$

LCM of n and $\frac{n(n-1)}{2}$ will be $\frac{n(n-1)}{2}$

The correct answer is B.

- 29.** Let the number of female employees be x and the number of male employees be y .

According to the question, we have:

$$x = 7y$$

The ratio of female employees to male employees

$$= \frac{x}{y} = \frac{7}{1}$$

So, the total number of employees should be a multiple of 8.

As 54 is not a multiple of 8 so 54 cannot be the total number of employees in the bank.

The correct answer is C.

- 30.** In an ordinary year, there are 52 weeks and one extra day and in a leap year there are 52 weeks and 2 extra days.

From August 15, 1947 to August 14, 1949, there is one ordinary year and one leap year, that is,

$$1 + 2 = 3 \text{ odd days}$$

So, August 15, 1949 would be a Friday + 3 days, that is, Monday.

$$\text{Number of days from August 15, 1949 to January 26, 1950} = 16 + 30 + 31 + 30 + 31 + 26 = 164$$

Therefore, number of odd days = 3

Hence, January 26, 1950 day would be Monday + 3 days, that is, Thursday.

The correct answer is A.

31. In such questions, always start from today. If today is 8 March, 2018, and it is Thursday, we can work backwards to April 20, 1984.

From 8 March, 1984 to 8 March, 2018, there are 34 years, of which there are 8 leap years and 26 normal years.

So, there would be $8 \times 2 + 26 \times 1 = 42$ odd days, which means 0 odd days.

So, 8 March, 1984 was also Thursday.

Now, from 8 March, 1984 to 20 April, 1984, number of days = $23 + 20 = 43$, which means 1 odd day. So, April 20, 1984 would be Friday.

The correct answer is B.

32. Since there are exactly 4 Wednesdays and 4 Sundays in the month of January having 31 days, the 1st of January that year has to be on Thursday because only then the month will end on a Saturday, with the month having 5 Thursdays, 5 Fridays and 5 Saturdays.

The correct answer is E.

33. If her age is x in the year 1980, then she was born in the year $1980 - x$.

As per the question,

$$x = \sqrt{1980 - x} \text{ or } x^2 + x - 1980 = 0$$

$$\text{Or } x = \frac{-1 + \sqrt{1 + 4 \times 1980}}{2} = 44$$

So, she was born in 1936.

The correct answer is B.

Alternatively,

The year of birth has to be a perfect square. The only option is 1936.

34. Total difference of years = 30 years

Leap years in these 30 years = 8

Normal years in these 30 years = 22

So, total number of odd days = $8 \times 2 + 22 = 38$

So, final odd number of days = $\frac{38}{7} = 3$ days

On 09.12.2001 is Sunday, so on 09.12.1971 there would have been Thursday.

The correct answer is E.

35. $\log_{10} 2 = 0.3010$ and also $\log_{10} 10 = 1$

So, $\log_{10}(2 \times 5) = 1$

$\log_{10} 2 + \log_{10} 5 = 1$ and so $\log_{10} 5 = 0.6990$

Now, $\log_5 256 = \log_{10} 256 / \log_{10} 5 = \log_{10} 28 / \log_{10} 5$

$= 8 \log_{10} 2 / \log_{10} 5 = 8 \times 0.3010 / 0.6990 = 3.44$

The correct answer is C.

36. Given $625^{\log 36^6} + 12^{\log 7^49} = 11^{\log_x 169}$

$\Rightarrow 625^{\frac{1}{2} \log 6^6} + 12^{\log 7^7} = 11^{\log_x 169}$

$\Rightarrow 625^{\frac{1}{2}} + 12^2 = 11^{\log_x 169}$

$\Rightarrow 25 + 144 = 11^{\log_x 169}$

$\Rightarrow 169 = 11^{\log_x 169}$

$\Rightarrow x = 11.$

The correct answer is B.

37. $\log_{30} 3 + \log_{30} 5 + \log_{30} 2 = 1$

$$[\log a + \log b + \log c = \log abc]$$

$$\Rightarrow x + y + \log_{30} 2 = 1$$

$$\Rightarrow \log_{30} 2 = 1 - x - y$$

$$\Rightarrow 3 \log_{30} 2 = 3(1 - x - y)$$

$$\Rightarrow \log_{30} 8 = 3(1 - x - y)$$

$$\Rightarrow \log_8 30 = \frac{1}{3(1 - x - y)}$$

The correct answer is B.

38. Let $a^p = b^q = c^r = d^s = k$

$$\text{Or, } a = k^{1/p}, b = k^{1/q}, c = k^{1/r} \text{ and } d = k^{1/s}$$

$$\log_a (bcd) = \log_k^{1/p} (k^{1/q} \times k^{1/r} \times k^{1/s})$$

$$= \log_k^{1/p} (k^{1/q + 1/r + 1/s})$$

$$= \frac{\left(\frac{1}{q} + \frac{1}{r} + \frac{1}{s}\right)}{\frac{1}{p}} = p\left(\frac{1}{q} + \frac{1}{r} + \frac{1}{s}\right)$$

The correct answer is A.

39. $\log_y x = 10 \Rightarrow \log_x y = \frac{1}{10}$

$$\text{So, } \log_{x^3} y^6 = \frac{6}{3} \log_x y = \frac{2}{10} = \frac{1}{5}$$

The correct answer is B.

40. Given $P = 625^{\frac{2}{\log_3 25}} + 25^{\log_{125} 27} + 5^{\frac{5}{\log_8 125}}$

$$= 625^{2\log_{25} 3} + 25^{\frac{3}{3}\log_5 3} + 5^{\frac{\frac{3}{3}5}{\log_2 5}}$$

$$= 625^{\frac{2}{2}\log_5 3} + 5^{2\log_5 3} + 5^{5\log_5 2}$$

$$= 5^{4\log_5 3} + 5^{\log_5 3^2} + 5^{\log_5 2^5}$$

$$= 3^4 + 3^2 + 2^5 = 122$$

$$= 3^4 + 3^2 + 2^5 = 122$$

The correct answer is C.

2 Arithmetic

1. The number that is 50% greater than 80 = $1.5(80) = 120$.

Similarly, the number that is 25% less than 200 = $0.75(200) = 150$.

Thus, the required percentage = $\frac{30}{150} = 20\%$

The correct answer is D.

2. The expenditure on rent, utilities, and insurance = 50%

The expenditure on food = 20%

The total expenditure on rent, utilities, insurance and food = $50\% + 20\% = 70\%$.

The income left = $100\% - 30\% = 30\%$

The expenditure on video games = 30% of 30% = $0.30 \times 0.30 = 0.09$, or 9%.

Therefore, the percentage of the income left after all of the expenditure = $30\% - 9\% = 21\%$

The correct answer is D.

3. 90% of 40 students or $0.9(40) = 36$ students had lower marks than Varun.

Of the 60 new students, 80% or $0.80(60) = 48$ students had lower marks than Varun.

Thus, $36 + 48 = 84$ students in the new, larger class have marks lower than Varun.

The new class has 100 students, 84 of whom have lower marks than Varun.

There are 16 students remaining, one of which is Varun. Since Varun has the lowest marks of this group of 16 students, there are 15

students above him.

Since the class has exactly 100 students, the required percentage = $\frac{15}{100} \times 100 = 15\%$.

The correct answer is D.

4. Machine Y's work in a 24-hour period exceeds Machine X's work by 48,000.

Let Machine X's packing rate in books per hour be a

That is to say:

$$36a - 24a = 48,000$$

$$12a = 48,000$$

$$a = 4,000$$

Machine X packs 4,000 books per hour.

The correct answer is A.

5. Let the production of rice in 1990 be 100 tonnes.

Then, the production of rice in 1995

$$= 100 \times 1.75 = 175 \text{ tonnes}$$

And the production of rice in 2000

$$= 175 \times 2 = 350 \text{ tonnes}$$

Thus the percentage increase in production from

$$\begin{aligned} 1990 \text{ to } 2000 &= \frac{350 - 100}{100} \times 100 \\ &= 250\% \end{aligned}$$

The correct answer is A.

6. Let 5 pizzas, 7 samosas and 4 ice-creams cost Rs. x. That is,

$$5 \text{ pizzas} + 7 \text{ samosas} + 4 \text{ ice-creams} = x \quad (1)$$

Then, 6 pizzas, 14 samosas and 8 ice-creams will cost Rs. 1.5x.
That is,

$$6 \text{ pizzas} + 14 \text{ samosas} + 8 \text{ ice creams} = 1.5x \quad (2)$$

In the first case, if Ankur has decided to buy all the items double, it would cost him Rs. 2x. That is,

$$10 \text{ pizzas} + 14 \text{ samosas} + 8 \text{ ice-creams} = 2x \quad (3)$$

Subtracting Eq. (2) from (3), we get

4 Pizzas cost Rs. 0.5x.

So, 5 Pizzas will cost Rs. 0.625x.

This is the amount that Ankur have spent on Pizzas. Hence, fraction of the total amount paid

$$= 0.625 = 62.5\%$$

The correct answer is E.

7. Cost price = $260 \times \frac{100}{100+30} = \text{Rs. } 200$

The correct answer is B.

8. Let cost price be Rs. 100.

Then, marked price = Rs. 130

On this a discount of 5% is given.

So, discount = 5% of 130 = Rs. 6.5

Hence, the selling price of goods

$$= \text{Rs. } (130 - 6.5) = \text{Rs. } 123.5$$

So, the profit percentage = 23.5%

The correct answer is C.

9. $(p \% q + q \% \text{ of } p)$

$$= \frac{pq}{100} + \frac{qp}{100} = \frac{2pq}{100}$$

$$= 2\% \text{ of } pq$$

The correct answer is C.

10. Given that, $p = 5q$

Percentage by which q is less than p

$$= \frac{p-q}{p} \times 100$$

$$= \frac{5q-q}{5q} \times 100$$

$$= \frac{4q}{5q} \times 100 = 80\%$$

The correct answer is D.

11. Amount of iodine in the mixture = 16% of 735 gm

Now, the amount of iodine becomes 20% of the mixture.

If amount of mixture after evaporation is x , then

$$20\% \text{ of } x = 16\% \text{ of } 735 \text{ or } x = 0.8 \times 735$$

$$\text{Amount evaporated} = 735 - 0.8 \times 735 = 147 \text{ gm}$$

The correct answer is C.

- 12.

$$A = P \left[1 + \left(\frac{r}{100} \right) \right]^t$$

(where A = amount; P = principle; r = rate of interest; t = time intervals)

$$\text{or, } 1650 = 1200 \left[1 + \left(\frac{r}{100} \right) \right]^2$$

$$\text{or, } \frac{1650}{1200} = \left[1 + \left(\frac{r}{100} \right) \right]^2$$

$$\text{or, } \sqrt{1.375} = 1 + \left(\frac{r}{100} \right)$$

$$\text{or, } 1.172 = 1 + \left(\frac{r}{100} \right)$$

Thus, $r =$ approximately 17%.

The correct answer is A.

- 13.** Given that an amount 'A' becomes three times in 6 years which means increment of '2A' occurs in 6 years. That is, increment of 'A' occurs in 3 years.

For the amount to be 24 times, increment of '23A' is required. Therefore, it will take 69 years to become 24 times.

The correct answer is C.

- 14.** Let us consider the compound interests for the first and the second year be CI_1 and CI_2 respectively.

$$\text{CI for the first year, } CI_1 = \frac{PR}{100}$$

$$\text{CI for the second year, } CI_2 = \left[P \left(1 + \frac{R}{100} \right)^2 - P \right] - CI_1$$

$$= \left[P \left(1 + \frac{R}{100} \right)^2 - P \right] - \frac{PR}{100} = P \left(\frac{R}{100} \right)^2 + \frac{PR}{100}$$

Therefore, the difference between the compound interests for the first year and the second year is given by:

$$CI_2 - CI_1 = \frac{PR^2}{100^2}$$

According to the question,

$$4P = \frac{PR^2}{10000}$$

$$\Rightarrow R = 200\%$$

The correct answer is D.

Alternatively,

We know that difference between SI and CI for the first two years is $\frac{PR^2}{100^2}$. It is given that difference of CI in the second year and that in the first year is 4 times the principal. Since CI for first year is same as SI for each of the years, the above difference is also the difference between CI of the first and the second year.

$$\text{So, } \frac{PR^2}{100^2} = 4P \text{ or } r = 200\%$$

15. Let the amount be $2x$.

Interest earned on amount deposited at

$$\text{Simple interest} = \frac{(4x)(10)}{100} = 0.4x$$

Interest earned on amount deposited at

$$\text{Compound interest} = x \left[\left(1 + \frac{10}{100} \right)^3 - 1 \right] = 0.331x$$

$$\text{Difference} = 0.069x = 1000$$

$$\Rightarrow x = \frac{1000}{0.069}$$

Therefore, total initial amount

$$= 2x = \frac{2000}{0.069} = \text{Rs. } 28,985$$

The correct answer is B.

16. According to the question,

$$121500 = P\left(1 - \frac{r}{100}\right)^2 = P\left(1 - \frac{10}{100}\right)^2 = P(0.9)^2$$

$$\Rightarrow P = \frac{121500}{0.9^2} = 150000$$

The correct answer is B.

17. Let the rate of interest be r .

According to the question,

$$\frac{800 \times 2 \times r}{100} + \frac{200 \times 3 \times r}{100} = 275$$

Solving the above equation, we get

$$r = 12.5\%$$

The correct answer is B.

18. Simple interest = $\frac{PRT}{100}$

$$P = \frac{P \times R \times 8}{100}$$

$$R = 12.5\%$$

The correct answer is A.

Alternatively,

In case of simple interest, an amount doubles if the rate of interest becomes 100%.

Let us consider the rate of interest is r .

Then, the time period ' t_d ' in which total interest becomes 100% is given by as below:

$$t_d = \frac{100}{r} \text{ or } r = \frac{100}{t_d} = \frac{100}{8} = 12.5\%$$

19. An amount doubles if the rate of interest becomes 100%.

Let us consider the rate of interest compounded annually is r .

Then, we know that the time period 'td' in which total interest becomes 100% is given by as below:

$$t_d = \frac{72}{r}$$

$$\text{Or, } r = \frac{72}{t_d} = \frac{72}{8} = 9\%$$

The correct answer is A.

20. Let Dev's share be Rs. x.

Suma's share = Rs. (250000 – x)

Suma invested her share at 10% per annum simple interest for 2 years

$$S.I = \frac{P \times R \times T}{100}$$

Suma's interest

$$= \text{Rs.} \frac{(250000 - x) \times 10 \times 2}{100}$$

$$= \text{Rs.} \frac{(250000 - x)}{5}$$

Dev invested his share compounded at 8% per annum for 2 years

$$C.I = P \left(1 + \frac{R}{100} \right)^T - P$$

$$= x \left(1 + \frac{8}{100} \right)^2 - x = \frac{104x}{625}$$

According to the question,

$$\frac{250000 - x}{5} - \frac{104x}{625} = 13360$$

$$\Rightarrow \frac{31250000 - 125x - 104x}{625} = 13360$$

$$\Rightarrow 229x = 31250000 - (13360 \times 625)$$

$$\Rightarrow 229x = 22900000$$

$$\Rightarrow x = 100000$$

Suma's share = Rs. (250000 – x)

$$= \text{Rs. } (250000 - 100000) = \text{Rs. } 1,50,000$$

The correct answer is D.

21. Principal = Rs. 23579

Principal triples itself in 3 years when compounded annually.

Let the rate be $R\%$ per year.

According to the question,

$$P\left(1 + \frac{R}{100}\right)^3 = 3P$$

$$\left(1 + \frac{R}{100}\right)^3 = 3 \quad (1)$$

We have to find in how many years will it become 27 times of itself.

Cubing Eq. (1) on both the sides, we get

$$\left\{\left(1 + \frac{R}{100}\right)^3\right\}^3 = (3)^3$$

$$\left(1 + \frac{R}{100}\right)^9 = 27 \quad (2)$$

Let time taken for it to become 27 times be T .

$$P\left(1 + \frac{R}{100}\right)^T = 27P$$

$$\Rightarrow \left(1 + \frac{R}{100}\right)^T = 27 \quad (3)$$

Comparing Eq. (2) and (3), we get

$$T = 9 \text{ years}$$

The correct answer is B.

22. Arvind's per hour sale = Rs. 78

Amount paid to the salesman per hour = Rs. 10

Therefore, the profit per hour = Rs. 68

Also, the amount paid for the roadside market per day = Rs. 150

So, the formula for his daily profit will be

Profit = Revenue – Expenses

$$P(h) = 68h - 150$$

The correct answer is C.

23. We know that profit equals revenue minus cost. Therefore, the company's profit is

$$p(9 - p) - (p + 15) = 9p - p^2 - p - 15$$

$$= -p^2 + 8p - 15$$

$$= -(p^2 - 8p + 15)$$

$$= -(p - 5)(p - 3)$$

When $p = 5$ or $p = 3$, the profit becomes 0, so eliminate (A) and (C). For $p > 5$, the profit becomes negative (that is, the company loses money). The profit is only positive if $(p - 5)$ and $(p - 3)$ have opposite signs, which occurs when $3 < p < 5$.

The correct answer is B.

24. For profit to be maximum, the derivative of p with reference to x must be 0 and hence $\frac{d(250x - 5x^2)}{dx} = 0$

$$250 - 10x = 0$$

$$\text{So, } x = 25$$

Now p for $x = 25$ is

$$250(25) - 5(25)^2 = \text{Rs. } 3,125$$

The correct answer is C.

25. Selling price of smartphone = 8000×1.25
= 10000

CP of 2nd phone = 10000

SP of 2nd phone = $10000 \times 0.8 = 8000$

Hence, overall the person made no profit or loss.

The correct answer is E.

26. If CP is Rs. 100 for 1 kg, actual CP = Rs. 84

And, SP = Rs. 96

So, profit = $\frac{12}{84} \times 100 = 14 \frac{2}{7} \% \text{ gain}$

The correct answer is B.

27. Profit = 15%, Discount = 5%

So, net profit% = $15 - 5 + \frac{15(-5)}{100}$

= $10 - 0.75 = 9.25\%$.

The correct answer is C.

28. Let SP of 1 pen be Re. 1.

So, SP of 630 pens = Rs. 630

Profit = SP of 90 pens = Rs. 90

So, CP of 630 pens

= SP of 630 pens – Profit from the same

= $630 - 90 = \text{Rs. } 540$

So, profit percent = $\frac{90}{540} \times 100 = 16.67\%$

The correct answer is C.

29. Amount kept in reserve fund = Rs. 40,000

Total dividend

$$= \text{Rs. } 240000 - \text{Rs. } 40000 = \text{Rs. } 200000$$

Face value of each preferred share = 10 Dividend per preferred share

$$= 10 \times \frac{15}{100} = 1.5$$

Total dividend in all preferred shares

$$= 1.5 \times 75000 = \text{Rs. } 1,12,500$$

Total dividend in all common shares

$$= 200000 - 112500 = 87500$$

Face value of each common share = 10

Let the dividend for common share be $x\%$.

$$\text{Dividend per common share} = 10 \times \frac{x}{100} = 0.1x$$

Total dividend in all common shares

$$= 0.1x \times 20000 = 2000x$$

According to the question,

$$2000x = 87500$$

$$\Rightarrow x = 43.75\%$$

New, total dividend in all common shares

$$= 240000 - 112500 - 25000$$

$$= \text{Rs. } 102500$$

Let the new dividend for common share be $y\%$.

Dividend per common share

$$= 10 \times \frac{y}{100} = 0.1y$$

New total dividend in all common shares

$$= 0.1y \times 20000 = 2000y$$

According to the question,

$$2000y = 102500$$

$$\Rightarrow y = 51.25\%$$

Required difference

$$= 51.25\% - 43.75\% = 7.5\%$$

The correct answer is B.

Alternatively,

Difference in money distributed as dividend to common shareholders

$$= 40000 - 25000 = 15000$$

If $x\%$ and $y\%$ are the percentage dividend in the earlier and later cases, then

$$y\% \text{ of } 10 \times 20000 - x\% \text{ of } 10 \times 20000 = 15000$$

$$\Rightarrow (y - x) = 7.5\%$$

30. SP of one mp3 player = Rs. 1710

Loss = 5%

$$\text{So, CP} = \frac{1710 \times 100}{(100 - 5)} = \text{Rs. } 1800$$

SP of other mp3 player = Rs. 2520

Gain = 20%

$$\text{So, CP} = \frac{2520 \times 100}{(100 + 20)} = \text{Rs. } 2100$$

Total CP = $(1800 + 2100) = \text{Rs. } 3900$

Total SP = $(1710 + 2520) = \text{Rs. } 4230$

$$\text{Gain} = \text{SP} - \text{CP}$$

$$\text{Total gain} = (4230 - 3900) = \text{Rs. } 330$$

$$\begin{aligned}\text{Gain \%} &= \frac{\text{Gain} \times 100}{\text{CP}} \\ &= \frac{330 \times 100}{3900} = 8.46\%\end{aligned}$$

The correct answer is D.

- 31.** Satish's commission on 10 book sets sold at Rs. 850 each

$$= 10 \times \left(850 \times \frac{15}{100} \right) = \text{Rs. } 1275$$

Satish's commission on 5 book sets sold at Rs. 750 each

$$= 5 \times \left(750 \times \frac{15}{100} \right) = \text{Rs. } 562.50$$

Satish's commission on 10 book sets sold at Rs. 700 each

$$= 10 \times \left(700 \times \frac{15}{100} \right) = \text{Rs. } 1050$$

Total number of book sets sold by Satish

$$= 10 + 5 + 10 = 25$$

If all book sets sold at Rs. 850, then Satish's Commission

$$= 25 \times \left(850 \times \frac{15}{100} \right) = \text{Rs. } 3187.50$$

Required answer

$$= \text{Rs. } 3187.50 - \text{Rs. } (1275 + 562.50 + 1050)$$

$$= \text{Rs. } 300$$

The correct answer is C.

Alternatively,

Extra payment would be received in case of second and third transaction.

So, extra commission

$$= 15\% \text{ of } (5 \times \text{Rs. } 100 + 10 \times \text{Rs. } 150)$$

$$= \text{Rs. } 300$$

- 32.** Let the CP of item be $4x$.

Then, SP will be $5x$.

$$\text{Profit} = \text{SP} - \text{CP} = 5x - 4x = x$$

According to the question,

$$x = 500$$

$$\text{Then, SP} = 5x = (5 \times 500) = \text{Rs. } 2500$$

The correct answer is D.

- 33.** Let the quantity of tea costing 10.40 in the mixture be x

$$\text{Then the quantity of tea costing } 8.80 = 15 - x$$

According to the question,

$$10.40x + 8.80(15 - x) = 146.40$$

$$\text{or, } 10.40x + 132 - 8.80x = 146.40$$

$$\text{or, } 1.6x = 14.40$$

$$\text{or, } x = \frac{14.40}{1.6} = 9 \text{ kg}$$

The correct answer is D.

- 34.** The chemist now has 10 litres of ink in a 30-litre mixture, so she must have 20 litres of water. You want to know the amount of ink you must add in order to make this mixture a 50% solution. Since no additional water is added, the solution must finish with 20 litres of water. Therefore, she also needs a total of 20 litres of ink, or 10 more litres than the mixture currently contains.

The correct answer is C.

35. 200% bigger means 'three times as big as' the original. If the pitcher is three times as big as the glass, then pouring the contents of the glass into the pitcher will make the pitcher $\frac{1}{3}$ full. If adding another 16 litres fills up the pitcher, the 16 litres must be equal to the remaining $\frac{2}{3}$ of the pitcher's capacity.

Then, $\frac{1}{3}$ of the pitcher's capacity = $\frac{16}{2} = 8$ litres.

So, the quantity of the juice mixture = 8 litres.

Therefore, the volume of lime juice in the mixture = 20% of 8 litres.

$$= (8)(0.2) = 1.6 \text{ litres}$$

The correct answer is A.

36. The ratio of boys to girls is 6 : 7. If you introduce the unknown multiplier x , the number of boys is $6x$, and the number of girls is $7x$, where x is a positive integer.

According to the question,

$$7x - 6x = 2$$

$$\text{or, } x = 2$$

Finally, substitute the value of x into the expression for the number of boys: $6x = 6(2) = 12$. There are 12 boys on the team.

The correct answer is A.

37. Use the weighted average formula to get the ratio of X to Y:

$$\left(\frac{0.55x + 0.70y}{x + y} \right) = 0.65, \text{ where } x \text{ is the amount of}$$

X and y is the amount of Y.

$$0.55x + 0.70y = 0.65(x + y)$$

$$0.55x + 0.70y = 0.65x + 0.65y$$

$$55x + 70y = 65x + 65y$$

$$55x + 5y = 65x$$

$$5y = 10x$$

$$\text{Thus, } \frac{y}{x} = \frac{2}{1}$$

Since y and x are in a 2 to 1 ratio, $\frac{2}{3}$ of the total is y and $\frac{1}{3}$ of the total is x.

Since the total is 120 grams, X accounts for $\frac{1}{3} \times 120 = 40$ grams of the mixed cereal.

The correct answer is B.

38.

$$\frac{a}{b} = \frac{abc}{b^2c} = 3$$

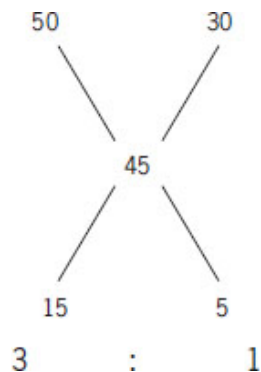
$$\frac{b}{c} = \frac{bc^2}{c^2} = 3$$

$$\frac{c}{d} = \frac{cd}{d^2} = 3$$

$$\frac{b^2c + c^2 + d^2}{abc + bc^2 + cd} = \frac{b^2c + c^2 + d^2}{3(b^2c + c^2 + d^2)} = \frac{1}{3}$$

The correct answer is B.

- 39.** Given that solution X contains 50% milk and solution Y contains 30% milk. Using the Alligation method, we can determine the ratio of volume of the two mixtures:



Therefore, the required ratio = 3:1

The correct answer is E.

- 40.** Let the required time be 'x' seconds.

Volume of solution transferred = 10x ml

Volume of milk transferred = 5x ml

Volume of water transferred = 5x ml

Ratio of volume of milk to the volume of water in the solution = 5x :
 $5x + 100 = 1 : 3$

$\Rightarrow x = 10$ seconds

The correct answer is B.

- 41. Combined age of the three children = $130 - 82 = 48$ years**

Age of the eldest child will be

$$\frac{7}{1+2+6+7} \times 48 = \frac{7}{16} \times 48 = 21 \text{ years}$$

The correct answer is C.

- 42.** Let the width of the rectangle be x.

Then, the length will be 2x.

Area of rectangle = Length $\times$ Width

Original area = $2x \times x = 2x^2$

Now, width is quadrupled and length is halved.

New width = 4x and new length = x

New area = $4x \times x = 4x^2$

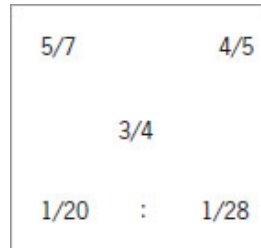
Ratio of original area to new area

$$= 2x^2 : 4x^2 = 1:2$$

The correct answer is A.

43. Use alligation

Fraction of milk in P and Q are $\frac{5}{7}$ and $\frac{4}{5}$ respectively. The resultant mixture has milk fraction $\frac{3}{4}$. Refer to the following diagram:



$$\frac{4}{5} - \frac{3}{4} = \frac{16 - 15}{20} = \frac{1}{20}$$

$$\text{Similarly, } \frac{3}{4} - \frac{5}{7} = \frac{21 - 20}{28} = \frac{1}{28}$$

$$\text{Therefore, required ratio} = \frac{1}{20} : \frac{1}{28}$$

$$= 28 : 20 = 7 : 5$$

The correct answer is D.

44.

$$6 = \frac{a + b + c + 6}{5}$$

$$\text{or, } a + b + c = 19$$

It is not necessary, or possible, to determine the values of a, b, and c individually. The second average includes all three variables, so the values will be summed again anyway.

$$\text{Required average} = \left(\frac{a + b + c + 13}{4} \right) = \frac{32}{4} = 8$$

The correct answer is A.

45. Weight of the teacher

$$= \text{Average weight} + \text{Weight contributed by increase in average}$$

$$= 42 + 38 \times 2 = 118 \text{ kg}$$

The correct answer is D.

46. Let number of men be n .

$$\text{Total weight of } n \text{ men initially} = 50 \times n = 50n \quad (1)$$

$$\begin{aligned} \text{After 2 persons leave, then resultant weight} \\ = 52(n - 2) \quad (2) \end{aligned}$$

Eq. (1) and (2) can be written as

$$50n = 52(n - 2) + 80$$

$$n = 12$$

The correct answer is E.

47. Let average weight of class 8th, 9th and 10th students be ka , kb and kc .

Let number of students in class 8th, 9th and 10th be jx , jy and jz .

$$\text{Then average weight} = \frac{\text{Total weight of all students}}{\text{Total number of students}}$$

$$= \frac{(ka \times jx) + (kb \times jy) + (kc \times jz)}{jx + jy + jz}$$

$$= \frac{jk(ax + by + cz)}{j(x + y + z)}$$

$$= \frac{k(ax + by + cz)}{x + y + z}$$

Here we do not have the value of k and hence it cannot be determined.

The correct answer is E.

48. The average age of husband and wife now is 30 years and the average age of husband, wife and the children now is 16 years.

$$\text{Total ages of children} = (16 \times 4) - (30 \times 2)$$

$$= 4 \text{ years}$$

As all of them have different ages with integral values, the only possibility is (1, 3) years.

The correct answer is A.

49. If a student aged 19 years replaced by a student aged 25 years.

Increase in total age of group = 6 years

Increase in total average age of group = 0.4 years

Therefore, total number of student

$$= \frac{6}{0.4} = 15 \text{ students}$$

The correct answer is D.

50. Average age of man, woman and child = 24 years

Total age of man, woman and child

$$= 24 \times 3 = 72 \text{ years} \quad (1)$$

Average age of mother, woman and child = 34 years

Total age of mother, woman and child

$$= 34 \times 3 = 102 \text{ years} \quad (2)$$

Difference in age of mother and son can be calculated using Eq. (1) and (2).

$$\text{Required difference} = 102 - 72 = 30 \text{ years}$$

The correct answer is C.

51. As the product of time taken to construct a hut and the number of workers doing the work is always constant, we have:

$$(3 \text{ hours}) \times (40 \text{ workers}) = (t \text{ hours}) \times (140 \text{ workers})$$

$$\text{or, } t = \frac{120}{140} = \frac{6}{7} \text{ hours}$$

$$= \frac{6}{7} \times 60$$

= approximately 51 minutes.

The correct answer is A.

52. The resort has $20(14) = 280$ of wood.

If the resort only needs to heat 15 rooms instead of 20, divide 280 by 15 to get 18.666.... You are asked for extra FULL days,

So extra FULL day will be 4.

The correct answer is B.

53. Ajay and Firoz' combined rate $= \frac{1}{4} + \frac{1}{3} = \frac{7}{12}$ So, in 2 hours, they should have completed $\frac{14}{12} = \frac{7}{6}$ of the job.

Therefore, Firoz' breaks cost them $\frac{7}{6} - 1 = \frac{1}{6}$ job worth of productivity.

Thus, Firoz' break time = the amount of time it would have taken him to do $\frac{1}{6}$ of the job = 30 minutes

Therefore, each of his 3 breaks was $\frac{30 \text{ minutes}}{3} = 10$ minutes long.

The correct answer is B.

54. First, figure out how many boxes worth of pens the machine produced in the 2 hours that it was on.

20 pens per hour is the rate, and 2 hours is the time:

Work = (20 pens per hour) $\times$ (2 hours) = 40 pens.

Now, since there are 10 pens per box, compute the number of boxes:

$$\begin{aligned} \text{The number of boxes} &= 40 \text{ pens} \times \left(\frac{1 \text{ box}}{10 \text{ pens}} \right) \\ &= 4 \text{ boxes} \end{aligned}$$

So Mahesh must pack 4 whole boxes to accommodate all the pens that the machine had made.

Mahesh's rate is 3 boxes per hour, while the total work is 4 boxes.
Rearrange and plug in:

$$\begin{aligned}\text{Time} &= \left(\frac{4}{3}\right) \text{ hours} \\ &= \frac{4}{3} \times 60 = 80 \text{ minutes}\end{aligned}$$

The correct answer is C.

55. Without the hole, the two taps will fill the tank in $\frac{1}{\frac{1}{4} + \frac{1}{5}} = \frac{20}{9}$ minutes

Let the hole empties the tank in X minutes, then

$$\begin{aligned}\frac{1}{\frac{1}{4} + \frac{1}{5} - \frac{1}{x}} &= \frac{20}{9} + \frac{1}{2} \\ \Rightarrow \frac{1}{x} &= \frac{81}{980} \\ \Rightarrow x &= \frac{980}{81} \text{ minutes}\end{aligned}$$

The correct answer is B.

56. If x, y and z are the time taken by P, Q and R respectively to fill the cistern alone, then

$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{1}{3} \quad (1)$$

Also, P works for 1 hour, whereas Q and R work for 5 hours in total.
Then,

$$\frac{1}{x} + 5 \times \frac{1}{y} + 5 \times \frac{1}{z} = 1 \quad (2)$$

Multiplying Eq. (1) by 5 and subtracting Eq. (2) from it, we get

$$4 \times \frac{1}{x} = \frac{5}{3} - 1 = \frac{2}{3}$$

$$x = 6 \text{ hours}$$

So, P alone can fill the cistern in 6 hours.

The correct answer is D.

57. P works for $X + 5$ minutes whereas Q works for X minutes only. So,

$$(X + 5) \times \frac{1}{12} + X \times \frac{1}{16} = 1$$

Or $X = 4$ minutes

The correct answer is C.

58. In one hour,

Suppose the quantity of water from pipe Y = w_1

The quantity of water from pipe X = w_2 ,

And, acid from pipe X = a

In first case, when the bucket is full,

$$\frac{a}{w_1 + w_2 + a} = \frac{8}{100} \quad (1)$$

$$\frac{w_1 + w_2 + a}{a} = 12.5 \text{ or } \frac{w_1}{a} + \frac{w_2}{a} = 11.5$$

In second case, the bucket is not full

$$\frac{a}{\frac{w_1}{2} + w_2 + a} = \frac{10}{100} \quad (2)$$

$$\frac{w_1}{2a} + \frac{w_2}{a} = 9$$

$$\Rightarrow \frac{w_2}{a} = 18 - 11.5 = 6.5 = 13 : 2$$

The ratio of acid to water in pipe X = $2 : 13$

The correct answer is E.

59. Part of the cistern filled by tap P in 1 minute = $\frac{1}{12}$

Part of the cistern filled by tap Q in 1 minute = $\frac{1}{18}$

Part of the cistern filled by both the taps in 1 minute = $\frac{1}{12} + \frac{1}{18} = \frac{5}{36}$

So, the cistern can be filled in $\frac{36}{5} = 7\frac{1}{5}$ min

The correct answer is D.

- 60.** Given that one worker can dig 250 m of tunnel in a week. It means one worker in two weeks can dig 500 m of tunnel.

So, for digging 20,000 m of tunnel in two weeks, the number of workers required is given by:

$$n = \frac{20,000}{500} = 40 \text{ workers}$$

The number of existing workers = 12

So, the number of extra workers required

$$= 40 - 12 = 28$$

The correct answer is E.

61.

Skilled workers	Days	Hours	Work
$\frac{2}{5} \times 33$	15	12	1
y	11	9	1.5

$$\text{Thus, } y = \left(\frac{2}{5}\right) \times 33 \times \left(\frac{15}{11}\right) \times \left(\frac{12}{9}\right) \times \left(\frac{3}{2}\right) = 36$$

The correct answer is A.

Alternatively,

Use the formula: $\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$.

$$\text{So, } \frac{\left(\frac{2}{5} \times 33\right) \times 15 \times 12}{1} = \frac{y \times 11 \times 9}{1.5} \text{ or } y = 36$$

62. Since each of the two assistants work $\frac{3}{4}$ as fast as Ajay, all the three put together will work

$$1 + \frac{3}{4} + \frac{3}{4} = \frac{5}{2} \text{ as fast as ajay alone can do it.}$$

Hence, if all three work together, they can finish the work in $\frac{2}{5}$ of the time taken by Ajay alone to do the work.

The correct answer is D.

Alternatively,

Let Ajay does 4 units per day. The job is 4 units of work. So assistants would do 3 units each per day. Hence, it takes them $\frac{4}{4+3+3} = \frac{2}{5}$ days which is $\frac{2}{5}$ of what Ajay takes working alone.

63. The minimum time is taken by C as he is not present in the maximum time of $22\frac{2}{9}$ days.

Similarly, the maximum time is taken by B as he is not present in the minimum time of $15\frac{5}{13}$ days.

The correct answer is A.

64. Let the efficiency of Pradeep be x.

Nitish works twice as fast as Pradeep.

So, efficiency of Pradeep = 2x

Nitish and Pradeep works together thrice as fast as Bhuvan.

So, efficiency of Nitish and Pradeep together

$$= x + 2x = 3x$$

$$\text{Efficiency of Bhuvan} = \frac{3x}{3} = x$$

Share of earnings is proportional to efficiencies of all the three workers.

Therefore, ratio of earnings share of all three
 $= 2x : x : x = 2 : 1 : 1$

The correct answer is A.

65. We know that $\frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$

Here, $M_1 = 100$, $D_1 = 80$, $W_1 = \frac{4}{5}$

And, $M_2 = ?$, $D_2 = 40$, $W_2 = \frac{1}{5}$

Putting the values, we get

$$\frac{100 \times 80}{(4/5)} = \frac{M_2 \times 40}{(1/5)}$$

$$\Rightarrow M_2 = 50$$

Therefore, the number of workers that can be let go
 $= 100 - 50 = 50$

The correct answer is C.

66. Rate of filling of tank in 1 minute $= \frac{1}{10}$

Rate of emptying of tank in 1 minute $= \frac{1}{8}$

So, in 1 minute the full tank will be emptied

$$= \frac{1}{8} - \frac{1}{10} = \frac{1}{40}$$

Thus, the time required to empty the full tank = 40 minutes

The correct answer is D.

67. Let's assume Sanya and Babli invested for 12 months

Therefore, Jhanvi invested for $12/4 = 3$ months

Let Sanya's investment be 100

Therefore, Jhanvi's investment = $100 \times 2 = 200$

And, Babli's investment = $0.5 \times 100 = 50$

Therefore, their total contribution is:

Sanya = $100 \times 12 = 1200$

Jhanvi = $200 \times 3 = 600$

Babli = $50 \times 12 = 600$

Thus, the ratio of Sanya : Jhanvi : Babli

= $1200 : 600 : 600$

= $2 : 1 : 1$

Therefore, the share of Sanya and Babli in profit

= $\frac{3}{4} \times 440000$

= 330000

The correct answer is E.

68. Let Tina's share be T, Ishan's share be I, Abhishek's share be A and Fatima's share be F.

Given that $T + 3 = I + \frac{I}{3} = \frac{80A}{100} = F - 4$

We get:

$$T = F - 7 \quad (1)$$

$$I = \frac{3}{4} (F - 4) \quad (2)$$

$$A = \frac{5}{4} (F - 4) \quad (3)$$

Also given that, $T + I + F + A = 80$ (4)

Substituting the values from Eq. (1), (2) and (3) in Eq. (4), we get:

$$\left[F + \frac{3F}{4} + \frac{5F}{4} + F \right] - 7 - 3 - 5 = 80$$

$$F = \text{Rs. } 23.75$$

The correct answer is C.

- 69.** Mukesh paid $\frac{1}{2}$ of what others paid.

$$\Rightarrow \text{Mukesh paid } \frac{1}{3} \text{rd of the total amount} = \text{£ } 20$$

Similarly,

Manish paid $\frac{1}{4}$ th of the total amount = £ 15 and Lalu paid $\frac{1}{5}$ th of the total amount = £ 12.

$$\text{Remaining amount of £ } 60 - \text{£ } 20 - \text{£ } 15 - \text{£ } 12$$

$$= \text{£ } 13 \text{ is paid by Jaggi.}$$

The correct answer is A.

- 70.** Since their investments in the business are for the same duration i.e. 1 year, profits will be shared in the ratio of their investments i.e. $21000 : 17500 = 6 : 5$.

$$\text{So, Yogesh's share} = \frac{6}{11} \times 26400 = \text{Rs. } 14400$$

$$\text{Mohan's share} = \frac{5}{11} \times 26400 = \text{Rs. } 12000$$

The correct answer is A.

3 Algebra and Probability

1. $3x^3 - 7 = 185$

or, $3x^3 = 192$

or, $x^3 = \frac{192}{3} = 64$

Thus $x = \sqrt[3]{64} = 4$

Thus, $x^2 - x = 16 - 4 = 12$

The correct answer is C.

2. Let the number of teams that participated be n . According to the question,

$$\frac{n(n-1)}{2} = 120$$

$$n^2 - n - 240 = 0$$

$$n^2 - 16n + 15n - 240 = 0$$

$$n(n-16) + 15(n-16) = 0$$

$$(n-16)(n+15) = 0$$

$$n = 16 \text{ (since } n \text{ can't be negative)}$$

The correct answer is E.

3. Let the roots of equation $ax^2 + bx + c = 0$ be m and n .

Then roots of equation, $px^2 + qx + r$

$= 0$ are $1/m$ and $1/n$

Now, $m + n = -b/a$ and $mn = c/a$

$1/m + 1/n = -q/p$ and $1/mn = r/p$

Also, $1/m + 1/n = (m + n)/mn$.

So, $-b/c = -q/p$ and also $c/a = p/r$

By these relations we get $a = r$, $c = p$ and $b = q$

The correct answer is E.

4. Discriminant, $D = (4b)^2 - 4a(2c)$

Since a , b and c are in GP, $b^2 = ac$

Hence, discriminant, $D = 16b^2 - 8b^2 = 8b^2 > 0$

Note that $8b^2$ cannot be zero as a , b and c are positive integers.

Hence, roots are real and distinct.

The correct answer is D.

5. The roots are -4 and -3 .

Then, $(p + q)^2 = (-7)^2 = 49$;

$(p - q)^2 = (-4 + 3)^2 = 1$

So, required equation is

$$x^2 - (49 + 1)x + (49)(1) = 0$$

$$\text{Or, } x^2 - 50x + 49 = 0$$

The correct answer is A.

6. Let p and q be the roots of the quadratic equation.

Given that, $p = 1.5q$ and $p - q = 1$ or $q - p = 1$

From these equations, we get

$$p = 3 \text{ and } q = 2 \text{ (or) } p = -3 \text{ and } q = -2$$

Since the quadratic equation with roots p and q is given by $(x - p)(x - q)$, it follows that equations can be $x^2 - 5x + 6 = 0$ (or) $x^2 + 5x + 6 = 0$

The correct answer is C.

7. p and q are roots of equation $ax^2 + bx + c = 0$

$$p + q = \frac{-b}{a} \text{ and } pq = \frac{c}{a}$$

We have to calculate value of $p^4 - q^4$

$$\begin{aligned} p^4 - q^4 &= (p^2 - q^2)(p^2 + q^2) \\ &= (p + q)(p - q)[(p + q)^2 - 2pq] \end{aligned}$$

To calculate the answer we have to get the value of

$$\begin{aligned} (p - q) \text{ and } [(p + q)^2 - 2pq] \\ (p - q) &= \pm \sqrt{(p + q)^2 - 4pq} \\ &= \pm \sqrt{\left(\frac{-b}{a}\right)^2 - \frac{4c}{a}} \\ &= \pm \frac{1}{a} \sqrt{b^2 - 4ac} \end{aligned} \tag{1}$$

$$\begin{aligned} [(p + q)^2 - 2pq] &= \left(\frac{-b}{a}\right)^2 - \frac{2c}{a} \\ &= \frac{b^2 - 2ac}{a^2} \end{aligned} \tag{2}$$

Putting values of Eq. (1) and (2), we get

$$\begin{aligned} p^4 - q^4 &= \left(\frac{-b}{a}\right) \left(\frac{b^2 - 2ac}{a^2}\right) \left(\pm \frac{1}{a} \sqrt{b^2 - 4ac}\right) \\ &= \mp \frac{b}{a^4} (b^2 - 2ac) (\sqrt{b^2 - 4ac}) \end{aligned}$$

The correct answer is E.

8. $2(x - 1)^3 + 3 \leq 19$

$$2(x - 1)^3 \leq 16$$

$$(x - 1)^3 \leq 8$$

$$x - 1 \leq 2$$

$$x \leq 3$$

The correct answer is B.

$$\begin{array}{ll}
 9. \quad (3a+7) \geq 2a+12 & \text{or} \quad -(3a+7) \geq 2a+12 \\
 a+7 \geq 12 & \text{or} \quad -3a-7 \geq 2a+12 \\
 a \geq 5 & \text{or} \quad -7 \geq 5a+12 \\
 & \text{or} \quad -\frac{19}{5} \geq a
 \end{array}$$

The correct answer is D.

$$\begin{array}{l}
 10. \quad \sqrt{192} < x\sqrt{12}, \\
 \text{or, } \frac{\sqrt{192}}{\sqrt{12}} < x \\
 \text{or, } \sqrt{16} < x \\
 \text{or, } 4 < x \\
 \text{Similarly,} \\
 \frac{x}{\sqrt{12}} < \sqrt{12} \\
 \text{or, } x < \sqrt{12}x\sqrt{12} \\
 \text{or, } x < 12
 \end{array}$$

The correct answer is D.

$$\begin{array}{l}
 11. \quad \text{If } \left(\frac{a}{b}\right)\left(\frac{x}{y}\right) < 0, \text{ then the two fractions must have opposite signs, that is,} \\
 \left(\frac{a}{b}\right) \text{ must be the negative inverse of } \left|\frac{x}{y}\right| \text{ or } \left|\frac{a}{b}\right| = -\left(\frac{y}{x}\right)
 \end{array}$$

Thus, D is the answer. The other choices may or may not be true.

The correct answer is D.

$$\begin{array}{l}
 12. \quad \text{Let } b \text{ equal the number of chairs sold. Each chair sells for Rs. 700,} \\
 \text{so the total revenue is Rs. } 700b. \text{ The cost is equal to 11,000 plus} \\
 \text{300 for every chair sold.}
 \end{array}$$

$$(700b) - (11,000 + 300b) > 0$$

$$700b - 11,000 - 300b > 0$$

$$400b - 11,000 > 0$$

$$400b > 11,000$$

$$b > 27.5$$

If b must be greater than 27.5, then the manufacturing unit needs to sell at least 28 chairs to make a profit.

The correct answer is C.

- 13. Note the absolute value sign in the original inequality. This basically means that the solution could lie on either side of the number line. So, you will have to solve this inequality in two ways to get the entire range of solutions for p .**

$$p + 5 < 9 \quad \text{or} \quad -(p + 5) < 9$$

$$p < 4 \quad \text{or} \quad p > -14$$

$$-14 < p < 4$$

The correct answer is C.

- 14. Let x^{2401} be a .**

We have to minimise $(a + 1/a + 2 \times a \times 1/a)^{1/2}$

$$= \left(a + \frac{1}{a} + 2 \right)^{1/2}$$

For a and $1/a$ we have A.M. (arithmetic mean)

$$= \frac{a + \frac{1}{a}}{2}$$

$$\text{G.M. (geometric mean)} = \left(a \times \frac{1}{a} \right)^{1/2} = 2 = 2$$

As, we know A.M. $\geq$ G.M.

$$\text{So, } \frac{a + \frac{1}{a}}{2} \geq \left(a \times \frac{1}{a} \right)^{1/2}$$

$$\text{So, } \left(a \times \frac{1}{a} \right) \geq 2$$

Its minimum possible value is 2 (for A.M. = G.M.)

So, minimum possible value of $(a + 1/a + 2 \times a \times 1/a)^{1/2} = (2 + 2)^{1/2} = 2$

The correct answer is A.

15. The simplest way to approach this question is to divide the marbles evenly among all 13 people and then adjust this number so that Manish ends up with the most marbles.

$$\frac{60}{13} = 4.61$$

Let Manish have 5 marbles. Then each of his friends can have at the most 4 marbles, giving a total of $(12 \times 4) + 5 = 53$ marbles. We still have 7 marbles left, so Manish may not necessarily end up with the most number of marbles.

Then, let Manish have 6 marbles. Now each of his friends can have at the most 5 marbles, giving a total of $(12 \times 5) + 6 = 66$ marbles. But we only have a total of 60 marbles, so if Manish keeps 6, there is no way any of his friends can end up with a greater number of marbles. Thus, the answer is 6.

The correct answer is B.

16. $a^2 - b^2 = 0$ can be rewritten as $a^2 = b^2$.

From here, it might look as though $a = b$, but this is not necessarily the case. For example, a could be 3 and b could be -3 . Algebraically, when you square root both sides of $a^2 = b^2$, you do NOT get $a = b$, but rather $|a| = |b|$. Thus, statement 1 is not necessarily true and statement 2 is true.

Statement 3 is also true:

$$a^2 - b^2 = 0$$

$$\text{or, } a^2 = b^2$$

$$\text{or, } \frac{a^2}{b^2} = 1$$

The correct answer is E.

17. The algebraic identity

$$\begin{aligned}x^2 - y^2 &= \sqrt{12} \times \sqrt{20} \\&= \sqrt{240} \\ \text{Then,} \quad &= \sqrt{16} \times \sqrt{15} \\&= 4\sqrt{15}\end{aligned}$$

The correct answer is B.

18. We know that $x^2 - y^2 = (x + y)(x - y)$

a^8 can be written as $(a^4)^2$

a^4 can be written as $(a^2)^2$

The given expression can now be solved as follows:

$$\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} = \frac{(a^4 + b^4)(a^4 - b^4)}{(a^4 + b^4)(a^2 + b^2)} = \frac{a^4 - b^4}{a^2 + b^2}$$

Now, factor $a^4 - b^4$ according to the same pattern:

$$\frac{a^4 - b^4}{a^2 + b^2} = \frac{(a^2 + b^2)(a^2 - b^2)}{(a^2 + b^2)} = a^2 - b^2$$

$$= (a + b)(a - b)$$

The correct answer is C.

19. We know that $(a - b)^2 = a^2 - 2ab + b^2$ and

$$(a + b)^2 = a^2 + 2ab + b^2$$

Then,

$$\begin{aligned}&(a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2 \\&= (a^2 - 4a + 4) + (a^2 - 2a + 1) + (a^2) + (a^2 + 2a + 1) \\&\quad + (a^2 + 4a + 4) \\&= (a^2 + 4) + (a^2 + 1) + (a^2) + (a^2 + 1) + (a^2 + 4)\end{aligned}$$

$$= 5a^2 + 10$$

The correct answer is B.

- 20.** The phrase “inversely proportional” means that $a = k/b$ or $ab = k$, where k is a constant.

As the product of a and b is always constant, we have:

$$24 \times 2 = 6 \times b,$$

$$\text{or } b = 8.$$

The correct answer is E.

- 21.** Let the number of pieces of cake eaten by each of the two people who eat the same quantity be P and the number of pieces of cake eaten by the third person be T .

According to the question:

$$P + P + (P + 2) = 14$$

$$\Rightarrow 3P + 2 = 14$$

$$\Rightarrow 3P = 12$$

$$\Rightarrow P = 4$$

You can use the value of P to solve for T :

$$\text{Therefore, the number of pieces eaten by the third person} = 4 + 2 = 6$$

The correct answer is D.

- 22.** Suppose the value of the red beads, the blue beads and the yellow beads are r , b and y respectively.

From the question,

$$r + b = 4.25$$

$$b + y = 2.75$$

$$r + b + y = 4.5$$

You need to find out 'r + y'

If $r + b = 4.25$, then $r + b + y = 4.5$ could be rewritten as:

$$4.25 + y = 4.5$$

$$y = 0.25$$

Since $b + y = 2.75$ and $y = 0.25$:

$$b + 0.25 = 2.75$$

$$b = 2.5$$

Since $r + b = 4.25$ and $b = 2.5$:

$$r + 2.5 = 4.25$$

$$r = 1.75$$

Therefore, $r + y = 1.75 + 0.25 = 2$.

The correct answer is B.

23. Let us consider,

E = price under the 'Exclusive' plan

R = price under the 'Regular' plan

x = the number of classes Karan takes

Then,

$$E = 495 + 15x$$

$$R = 80x$$

$$0.6R = E$$

Now, solving the above equations by substitution:

$$0.6R = 495 + 15x$$

$$0.6(80x) = 495 + 15x$$

$$48x = 495 + 15x$$

$$33x = 495$$

$$x = 15$$

The correct answer is C.

- 24.** Let the number of correct answers be x ; so the number of incorrect answers will be $25 - x$.

According to the problem,

$$3x - 0.5(25 - x) = 40$$

$$\Rightarrow 3x - 12.5 + 0.5x = 40$$

$$\Rightarrow x = 15$$

$$\text{The number of incorrect answers} = 25 - 15 = 10$$

$$\text{The required difference} = 15 - 10 = 5$$

The correct answer is A.

- 25.** Let the number of persons be x and contribution per person be Rs. y .

Therefore, the total contribution = Rs. xy

Also, the total contribution

$$= (x - 3)(y + 10) = xy + 10x - 3y - 30$$

Since the contribution is the same, therefore:

$$xy = xy + 10x - 3y - 30$$

$$\Rightarrow 10x - 3y = 30$$

$$\Rightarrow 3y = 10x - 30$$

If $x = 3$, $y = 0$; this is not possible as the total contribution will be 0.

(Note that when $x = 3$ or 4 , y will not be an integer value).

If $x = 6$, $y = 10$; this condition is possible, so the minimum total contribution possible is Rs. 60.

If 10 people had joined for the party, contribution per person = $\frac{60}{10} =$ Rs. 6

The correct answer is C.

26. Assume some values of p , q and r such that $p + q + r = 0$ and find the value of the expression that is given, so suppose $p = 1$, $q = -1$ and $r = 0$.

We find that,

$$\frac{p^2}{2p^2 + qr} + \frac{q^2}{2q^2 + pr} + \frac{r^2}{2r^2 + pq} = \frac{1}{2} + \frac{1}{2} + 0 = 1$$

The correct answer is B.

27. Let the number of swans be x .

$$\text{So, we get: } 7 \times \frac{1}{2} \times \sqrt{x} + 2 = x$$

Now using options, we realise that $x = 16$ satisfies the equation.

So, number of swans is 16.

The correct answer is B.

28. $\frac{1}{p^2} - \frac{1}{q^2} = \left(\frac{1}{p} + \frac{1}{q}\right)^2 - 1 \times \frac{1}{pq} = m^2 - 2n$

The correct answer is C.

29. Given $f(x + 2) + f(5x + 6) = 2x - 1$

When $(x + 2) = 1$, $x = -1$, at which the value of $(5x + 6)$ is also 1.

So, putting $x = -1$ in the given equation, we get:

$$f(1) + f(1) = -3$$

$$f(1) = \frac{-3}{2}$$

The correct answer is D.

30. For no solution of the equations

$$4x - Ky = -7 \text{ and } 5x + 3y = 2$$

$$\frac{4}{5} = \frac{-K}{3} \neq \frac{-7}{2}$$

$$K = \frac{-12}{5}$$

The correct answer is C.

31. $-4 > -5$, therefore, $[(-4)@(-5)] = (-4)$

Then, $(-4)\%2 = -4$ (Since $A \times B$ is negative)

The correct answer is D.

32. $\frac{1@-1}{(-K)@(-K)} \% K, K > 0$

$$= \frac{1}{-K} \% K$$

$$= \frac{1}{-K}$$

The correct answer is C.

33. For a quadratic equation,

$$\text{Sum of the roots} = \frac{-b}{a}$$

$$\text{And product of the roots} = \frac{c}{a}$$

According to the problem,

$$-\frac{b}{a} = \frac{5}{4} \left(\frac{c}{a} \right)$$

$$\Rightarrow -4ab = 5ac$$

$$\Rightarrow b = -\frac{5}{4}c$$

The correct answer is C.

34. $a^2 + 2b = b^2 + 2a + 5$

$$a^2 - 2a = b^2 - 2b + 5$$

Adding 1 to the both sides of the expression, we get

$$\Rightarrow (a^2 + 2a + 1) = (b^2 - 2b + 1) + 5$$

$$\Rightarrow (a - 1)^2 = (b - 1)^2 + 5$$

$$\Rightarrow (a - 1)^2 - (b - 1)^2 = 9 - 4$$

Comparing the value, we get

$$(a - 1) = 3, \Rightarrow a = 4$$

$$(b - 1) = 2, \Rightarrow b = 3$$

The correct answer is D.

35. The given information can be tabulated as follows:

Week no.	Payment for the week	Cumulative payment
1	1000	1000
2	$1000 + 1000 = 2000$	$1000 + 2000 = 3000$
3	$1000 + 3000 = 4000$	$3000 + 4000 = 7000$
4	$1000 + 7000 = 8000$	$7000 + 8000 = 15000$
5	$1000 + 15000 = 16000$	$15000 + 16000 = 31000$
6	$1000 + 31000 = 32000$	$31000 + 32000 = 63000$

The correct answer is D.

36. The collection figures are in AP, with the first term as 100,000 and the common difference is 20,000.

Then,

$$S_{10} = \frac{10}{2} [2a + (n - 1) \times d]$$

$$= 5[200,000 + (9 \times 20,000)]$$

$$= 5 (380,000)$$

$$= \text{Rs. } 1900,000$$

The correct answer is E.

- 37.** Ajit puts Re 1 on January 1, Rs. 3 on January 2, Rs. 6 on January 3, Rs. 12 on January 4 and so on.

So, the series is $1 + 3 + 6 + 12 + 24 + \dots$

The 2nd to 31st term are in G.P. with 1st term 3 and common ratio = 2

So, the total money in Ajit's piggy bank at the end of January is sum of series $1 + 3 + 6 + 12 + 24 \dots$

$= 1 + \text{sum of 30 terms of G.P. with 1st term and common ratio 3 and 2 respectively}$

$$= 1 + a(r^n - 1)/(r - 1) \text{ (where } a = 3; r = 2 \text{ and } n = 30)$$

So, amount at the end of January is

$$= 1 + 3(2^{30} - 1)/(2 - 1)$$

$$= 1 + 3(2^{30} - 1)$$

$$= 1 + 3(2^{30}) - 3$$

$$= 3(2^{30}) - 2$$

The correct answer is C.

- 38.** Here, the person saves Rs. 400 in the first year, Rs. 600 in the second year, Rs. 800 in the third year and so on.

Hence, this forms an AP with the first term, $a = 400$ and the common difference, $d = 200$.

According to the question,

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

$$\Rightarrow 18000 = \frac{n}{2} [800 + (n - 1)200]$$

$$\Rightarrow 18000 = \frac{n}{2} [600 + 200n] = 300n + 100n^2$$

$$\text{We have } n^2 + 3n - 180 = 0$$

$$\Rightarrow n = 12$$

The correct answer is B.

39. Given that, $T_2 = ar = 6$ and $T_5 = ar^4 = 48$

$$\text{Hence, } r = 2 \text{ and } a = 3$$

$$\text{So, } T_{10} = 3 \times 2^9 = 1536$$

The correct answer is C.

40. $\frac{p}{q}, \frac{q}{r}, \frac{r}{s}, \frac{s}{p}$ are all positive real numbers and for positive numbers.

$$\text{A.M.} \geq \text{G.M.}$$

$$\text{So, } \frac{\frac{p}{q} + \frac{q}{r} + \frac{r}{s} + \frac{s}{p}}{4} \geq \sqrt[4]{\frac{p}{q} \times \frac{q}{r} \times \frac{r}{s} \times \frac{s}{p}}$$

$$\text{or, } \frac{p}{q} + \frac{q}{r} + \frac{r}{s} + \frac{s}{p} \geq 4$$

The correct answer is E.

41. Suppose $b = ar$, $c = ar^2$ and $d = ar^3$. Then,

$$\frac{1}{a^3 + b^3} = \frac{1}{a^3(1 + r^3)}$$

$$\frac{1}{b^3 + c^3} = \frac{1}{a^3 r^3(1 + r^3)}, \text{ and}$$

$$\frac{1}{c^3 + d^3} = \frac{1}{a^3 r^6(1 + r^3)}$$

Clearly, $(a^3 + b^3)^{-1}$, $(b^3 + c^3)^{-1}$, and $(c^3 + d^3)^{-1}$ are also in GP with common ratio $\frac{1}{r^3}$

The correct answer is B.

42. The series is an AP with $a = 70$, $d = 10$ and $n = 20$.

$$S_n = \frac{20}{2} [2 \times 70 + (20 - 1)10]$$

$$S_n = 10(140 + 190)$$

$$S_n = 10(330)$$

$$S_n = 3300$$

The correct answer is E.

43. We have to calculate the sum of values of hour hand in a day when minute hand is on 12.

Also, when minute hand is on 12, hour hand point towards inegral values between 1 to 12 because of exact hour completion.

In a single day, hour hand rotates two times pointing integer between 1 to 12.

Therefore, summation of required values

$$= 2 \cdot \sum_{k=1}^{12} k = 2 \cdot \frac{12 \times 13}{2} = 156$$

The correct answer is C.

44. We have to compute the value of expression

$$\sum_{k=2}^7 (2k - 1)$$

The expression can also be written as

$$\begin{aligned}
& \sum_{k=1}^7 (2k-1) - [(2 \times 1) - 1] \\
& \Rightarrow \left[\sum_{k=1}^7 (2k-1) \right] - 1 \\
& = \left[2 \cdot \frac{n(n+1)}{2} - n \right]_{n=7} - 1 \\
& \left(\text{Sum of first } n \text{ natural numbers} = \frac{n(n+1)}{2} \right) \\
& = \left[2 \cdot \frac{7(7+1)}{2} - 7 \right] - 1 = 56 - 8 = 48
\end{aligned}$$

The correct answer is D.

45. To figure out the 'limiting factor', take the number of players available for each position and figure out how many sets could be formed in each case, if there were more than enough players in all the other positions.

Batsmen: 23 players available $\div$ 2 players needed per set = 11.5 sets = 11 complete sets.

Bowlers: 21 players available $\div$ 3 bowlers needed per set = 7 complete sets.

Wicketkeepers: 9 players available $\div$ 1 wicketkeeper needed per set = 9 complete sets.

Thus, only 7 complete sets can be formed, using all of the available bowlers and some of the other players. A total of $7 \times 2 = 14$ batsmen are required, leaving $23 - 14 = 9$ unused batsmen. Likewise, $7 \times 1 = 7$ wicketkeepers are required, leaving $9 - 7 = 2$ unused wicketkeepers. In all, there are $9 + 2 = 11$ unused players, who will not be on any team.

The correct answer is C.

46. For the first digit, there are only five options (5, 6, 7, 8, and 9) because a five-digit number must start with a non-zero integer. For the second digit, there are 5 choices again, because now zero can be used but one of the other numbers has already been used, and numbers cannot be repeated. For the third

number, there are 4 choices, for the fourth there are 3 choices, and for the fifth number there are 2 choices. Thus, the total number of choices is $(5)(4)(3)(2) = 120$.

The correct answer is D.

47. The number of ways in which the friends can be arranged with Binod and Dravid separated is equal to the total number of ways in which the friends can be arranged minus the number of ways they can be arranged with Binod and Dravid together.

The total number of ways to arrange 5 people in a line is $5! = 120$.

To compute the number of ways to arrange the 5 friends such that Binod and Dravid are standing together, group Binod and Dravid as one person, since they must be lined up together. Then the problem becomes one of lining up 4 students, which gives $4!$ possibilities.

However, remember that there are actually two options for Binod and Dravid coming together: Binod first and then Dravid or Dravid first and then Binod. Therefore, there are $(4!)(2) = (4)(3)(2)(1)(2) = 48$ total ways in which the five friends can be lined up with Dravid and Binod standing together.

Therefore, there are $120 - 48 = 72$ arrangements where Binod will be separated from Dravid.

The correct answer is C.

48. Any number is divisible by 8 if its last 3 digits are divisible by 8.

So, we have to make total possible 5 digit numbers so that last 3 digits are divisible by 8 using the digits 1, 2, 3, 4, 5 and 6 and without repetition.

So, we must first fix the last 3 digits and only then can the other digits be fixed.

Case 1 3rd digit is 1

- (a) If 4th digit is 2 then we have only 120 and 128 divisible by 8 but, these can't be used.

- (b) If 4th digit is 3 then there is only 1 possibility of 136 — these are such 6 possible numbers (as we have $3 \times 2 \times 1 \times 1 \times 1$ such possible numbers).
- (c) If 4th digit is 4 — we can't find the number which is divisible by 8.
- (d) If 4th digit is 5 then 152 is only possible number divisible by 8 — we again have such 6 numbers (again $3 \times 2 \times 1 \times 1 \times 1$).
- (e) If 4th digit is 6 — we can't have such a number which is divisible by 8.

Case 2 3rd digit is 2

- (a) If 4th digit is 1 then we have only 216 and so such 6 numbers are possible.
- (b) If 4th digit is 3 then there is no such number.
- (c) If 4th digit is 4 — we can't find the number which is divisible by 8.
- (d) If 4th digit is 5 then 256 is the only possible number divisible by 8 — we again have such 6 numbers (again $3 \times 2 \times 1 \times 1 \times 1$).
- (e) If 4th digit is 6 — we have 264 divisible by 8 and again such 6 numbers are possible.

Case 3 3rd digit is 3

- (a) If the 4th digit is 1 then we have only 312 and so such 6 numbers are possible.
- (b) If the 4th digit is 2 then there is no such number.
- (c) If the 4th digit is 4 — we can't find the number which is divisible by 8.
- (d) If 4th digit is 5 then 352 is only possible number divisible by 8 — we again have such 6 numbers (again $3 \times 2 \times 1 \times 1 \times 1$).
- (e) If the 4th digit is 6 — no such number is possible.

Case 4 3rd digit is 4

- (a) If the 4th digit is 1 then we have only 416 and so such 6 numbers are possible.
- (b) If the 4th digit is 2 then no such number is possible.

- (c) If the 4th digit is 3 then we have 432 and such 6 numbers are possible.
- (d) If the 4th digit is 5 then 456 is the only possible number divisible by 8 — we again have such 6 numbers (again $3 \times 2 \times 1 \times 1 \times 1$).
- (e) If the 4th digit is 6 — no such number is possible.

Case 5 3rd digit is 5

- (a) If the 4th digit is 1 then we have only 512 and so such 6 numbers are possible.
- (b) If the 4th digit is 2 then there is no such number.
- (c) If the 4th digit is 3 — 536 and so such 6 numbers are possible.
- (d) If the 4th digit is 4 — no such number is possible.
- (e) If the 4th digit is 6 — no such number is possible.

Case 6 3rd digit is 6

- (a) If the 4th digit is 1 then no such number is possible.
- (b) If the 4th digit is 2 then 624 is possible and so 6 numbers can be formed.
- (c) If the 4th digit is 3 then we have 632 and such 6 numbers are possible.
- (d) If the 4th digit is 4 then no such number can be formed.
- (e) If the 4th digit is 5 — no such number is possible.

Total such possible numbers are $12 + 18 + 12 + 18 + 12 + 12 = 84$

The correct answer is D.

Alternatively,

The last three digits of the number can be from 121 to 165, or 213 to 265, ..., or 612 to 654.

In the list 121 to 165, the numbers which are multiples of 8 without repetition of digits and which use available digits only, are 136 and 152.

Similarly, in the list 213 to 265, the numbers are 216, 256 and 264.

In the list 312 to 365, the numbers are
312 and 352.

In the list 412 to 465, the numbers are
416, 432 and 456.

In the list 512 to 546, the numbers are
512 and 536.

In the list 612 to 654, the numbers are
624 and 632.

The leftmost two digits in each of the above cases can be filled in $3 \times 2 = 6$ ways

So, total such numbers are $6 \times 14 = 84$

- 49.** First distribute 2 balls in each of the boxes. So, we are left with 4 identical balls to be distributed in 3 boxes.

We know that the number of ways of distributing 'n' identical balls among 'k' different boxes = ${}^{n+k-1}C_{k-1}$ The number of ways = ${}^{4+3-1}C_{3-1} = {}^6C_2 = \frac{6!}{4! \times 2!} = 15$

The correct answer is A.

- 50.** Since the hexagon formed by joining those 6 points is regular, any pentagon formed using 5 vertices will be congruent.

Hence, only one pentagon with distinctly different area can be formed.

The correct answer is D.

- 51.** In each section 3 questions are to be selected from the five designated questions. This can be done in ${}^5C_3$ ways.

Hence, the total number of different tests

$$= {}^5C_3 \times {}^5C_3 \times {}^5C_3 = 1000$$

The correct answer is E.

- 52.** If five different types of sweets A, B, C, D and E then the required answer will be non-negative integral solution of the equation

$$A + B + C + D + E = 8$$

Hence required answer

$$= {}^{8+5-1}C_{5-1} = {}^{12}C_4 = 495$$

The correct answer is B.

- 53.** We have 13 Y (yellow) balls, 19 G (green) balls, 27 R (red) balls, 10 B (black) balls, 7 b (brown) balls and 14 W (white) balls in all.

Let us take out maximum 13 balls of different colours, then we can

take out (13Y) + (13G) + (13R) + (10B) + (7b) + (13W) balls = 69 balls.

If we take one more ball out now, we will certainly get 14 balls of either green, red or white colour. That is, if we take out 70 balls from the bag, we will get 14 balls (at least) of same colour.

The correct answer is B.

- 54.** Out of 5 girls, 3 girls can be invited in ${}^5C_3$ ways. Nothing is mentioned about the number of boys that Salim has to invite.

Salim can invite 1, 2, 3, 4, or even no boy.

Out of 4 boys, Salim can invite them in the said manner in $= {}^5C_3 \times (2)^4 = 10 \times 16 = 160$

The correct answer is B.

- 55.** Out of total 12 holes, at least 3 holes with red coloured balls can be filled in the following ways:

3 red coloured balls + 9 other coloured balls

$$= {}^5C_3 \times {}^{10}C_9 = 100$$

4 red coloured balls + 8 other coloured balls

$$= {}^5C_4 \times {}^{10}C_8 = 225$$

5 red coloured balls + 7 other coloured balls

$$= {}^5C_5 \times {}^{10}C_7 = 120$$

The sum of these three cases

$$= 100 + 225 + 120 = 445$$

The correct answer is C.

56. The possible arrangements are as below:

__ O __

So, the remaining 4 letters can be arranged at the remaining four places in 4! ways.

So, number of ways of arranging remaining 4 letters

$$= 4 \times 3 \times 2 \times 1 = 24 \text{ ways}$$

The correct answer is D.

57. There are total 8 batsmen in team A and we want to select 6.

$$\text{The required number of ways} = {}^8C_6 = \frac{8!}{2!6!} = 8 \times \frac{7}{2}$$

$$= 28 \text{ ways.}$$

The correct answer is D.

58. Total number of ways = ${}^{10}C_6 \times {}^4C_3 \times {}^1C_1$

$$= \frac{10 \times 9 \times 8 \times 7}{4!} \times 4 \times 1 = 840$$

The correct answer is C.

59. Number of ways = ${}^{12}C_8 \times {}^3C_2 \times {}^3C_1$

$$= \frac{12 \times 11 \times 10 \times 9}{4!} \times 3 \times 3 = 4455$$

The correct answer is A.

60. The factors of 210 are as follows:

1 and 210

2 and 105

3 and 70

5 and 42

6 and 35

7 and 30

10 and 21

14 and 15

Out of the list of 16 factors, there are two multiples of 42 (42 and 210).

Thus, the answer is $\frac{2}{16}$ or $\frac{1}{8}$.

The correct answer is C.

61. In this case, there are two independent events: hail on Thursday and hail on Friday. The question asks about the probability that there will be hail on both the days. Hence, we simply need to multiply the individual probabilities together as follows to arrive at the answer:

$$= \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

The correct answer is A.

62. There are 12 girls and 20 boys in the classroom. If $\frac{1}{4}$ of the girls have cell phones, then there are $12 \times \frac{1}{4} = 3$ girls with cell phones. Therefore,

there are $12 - 3 = 9$ girls who do NOT have cell phones.

Therefore, the probability of choosing a girl who does not have a cell phone is the number of girls without cell phones divided by the total number of children, which is $\frac{9}{32}$.

The correct answer is B.

63. The probability that at least one roll results in a number higher than 4 is equal to 1 minus the probability that all three of the rolls result in numbers 4 or lower. For one roll, there are 6 possible outcomes and 4 ways in which the outcome can be 4 or lower, so the probability is $\frac{4}{6} = \frac{2}{3}$. Thus, the probability that all three rolls result in numbers 4 or lower is $\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \frac{8}{27}$. This is the result that you do NOT want; subtract this from 1 to get the probability that you do want:

Therefore, the required probability = $1 - \left(\frac{8}{27}\right) = \frac{19}{27}$

The correct answer is D.

64. This question is an OR question, so you may be tempted to simply add the two probabilities. However, this will give you a number greater than 100%, which is NEVER possible: $0.8 + 0.25 = 1.05$. This is because this figure double-counts the cases where Deeksha skips her lunch and there is a power failure. Subtract out these cases in order to find the desired value.

In order to calculate the probability that Deeksha will skip her lunch AND that there will be a power failure, multiply the individual probabilities together:

$$0.8 \times 0.25 = 0.2$$

Then, subtract to find the required probability:

$$1.05 - 0.2 = 0.85, \text{ or } 85\%$$

The correct answer is C.

65. The probability of choosing Bag A, $P(A)$, and the probability of choosing Bag B, $P(B)$, must be the same, that is, $P(A) = P(B) = \frac{1}{2}$.

If Bag A is chosen, what is the probability of a matched pair? First, compute the probability of two whites. The probability of the first white is $\frac{3}{6}$ and the probability of the second white is $\frac{2}{5}$ so the probability of a first AND second white is $\left(\frac{3}{6}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$. Similarly, the probability of two reds is $\left(\frac{3}{6}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$. If Bag A is chosen, you can obtain a match by either choosing a pair of white OR a pair of red, so you must add their probabilities to get the total chance of a pair. This gives $P(\text{Bag A Pair}) = \frac{1}{5} + \frac{1}{5} + \frac{2}{5}$.

Similarly, if Bag B is chosen, the probability of a pair of white beads is $\left(\frac{6}{9}\right)\left(\frac{5}{8}\right) = \frac{5}{12}$ and the probability of a pair of red beads is $\left(\frac{3}{9}\right)\left(\frac{2}{8}\right) = \frac{1}{12}$. Therefore, the probability of a pair is $P(\text{Bag B pair})$

$= \frac{5}{12} + \frac{1}{12} = \frac{6}{12} = \frac{1}{2}$. The probability of choosing Bag A and a pair from Bag A is the product of the two events, $\left(\frac{1}{2}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$.

Similarly, the probability of choosing Bag B and a pair from Bag B is $\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{4}$. The total probability of choosing a pair will be the probability of choosing Bag A and a pair from Bag A or choosing Bag B and a pair from Bag B, meaning you must sum up these two events. This gives: $P(\text{pair})$

$$= \frac{1}{5} + \frac{1}{4} = \frac{4}{20} + \frac{5}{20} + \frac{9}{20}.$$

The correct answer is C.

66. Total possible results on rolling two dice,

$$n(S) = 6^2 = 36$$

Let A be the event that a sum of 10 or more occurs.

$$A = \{(4,6), (5,5), (5,6), (6,4), (6,5), (6,6)\}$$

$$n(A) = 6$$

$$\text{Required probability} = \frac{1}{6}$$

The correct answer is C.

- 67.** Let A be the event of getting two bananas and B be the event of getting two good fruits.

Therefore, $(A \cap B)$ will be the event of getting two good bananas.

$$P(A) = P(\text{Get 2 bananas}) = \frac{{}^{20}C_2}{{}^{30}C_2}$$

$$P(B) = P(\text{Get 2 good fruits}) = \frac{{}^{23}C_2}{{}^{30}C_2}$$

$$P(A \cap B) = \frac{{}^{15}C_2}{{}^{30}C_2}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) = \frac{338}{435}$$

The correct answer is B.

- 68.** Since the events are independent, the outcome of one will not affect the other.

$$\text{Given that } P(M) = 0.5 \text{ and } P(N) = 0.4$$

$P(M/N)$ means the probability of the event M given that the event N has already occurred.

$$\text{So, the } P(M/N) = P(M) = 0.5$$

The correct answer is B.

- 69.** Total number of roll numbers = 100

The number of rolls numbers which are multiples of 3 = 33

$$\text{So, the required probability} = \frac{33}{100}$$

The correct answer is C.

70. Let the number be x . Then,

$$x + \frac{336}{x} \leq 50 \text{ or } (x - 8)(x - 42) \leq 0$$

$$\text{Or, } 8 \leq x \leq 42$$

So, x can be anything from 8 to 42, that is, 35 numbers.

$$\text{Required probability} = \frac{35}{50} = \frac{7}{10}$$

The correct answer is A.

4 DI-Caselets and Tables

1. Ratio in 2010 = $\frac{3}{50} = 0.06$
Ratio in 2011 = $\frac{2}{45} = 0.044$
Ratio in 2012 = $\frac{2.5}{40} = 0.0625$
Ratio in 2014 = $\frac{2.5}{48} = 0.052$
Ratio in 2015 = $\frac{2.1}{41} = 0.051$

Thus, the ratio was highest in 2012.

The correct answer is C.

2. Ratio in 2010 = $\frac{4}{60} = 0.066$
Ratio in 2012 = $\frac{3.5}{62} = 0.056$
Ratio in 2013 = $\frac{1.5}{40} = 0.037$
Ratio in 2014 = $\frac{2}{45} = 0.044$
Ratio in 2015 = $\frac{2.3}{50} = 0.046$

Thus, the ratio was lowest in 2013

The correct answer is C.

3. The required difference = $700 - 550 = 150$

The correct answer is A.

4. The required percentage = $\left(\frac{62 - 3.5}{58 - 4}\right) \times 100$
= approximately 108%

The correct answer is D.

5. The required percentage for Prisma
 $= \frac{1050}{4500} \times 100 = \text{approximately } 23.33 \%$

The required percentage for Shelby
 $= \frac{800}{4100} \times 100 = \text{approximately } 19 \%$

The required percentage for Kooper
 $= \frac{1000}{4300} \times 100 = \text{approximately } 23.25 \%$

The required percentage for Wendy
 $= \frac{1100}{5450} \times 100 = \text{approximately } 20 \%$

The required percentage for Caret
 $= \frac{950}{4350} \times 100 = \text{approximately } 22 \%$

The correct answer is C.

6. The required percentage $\frac{1100}{1000} \times 100$

The correct answer is C.

7. While you can try calculating the required ratio for all the companies to get to the answer, the faster way to calculate this question is to look at the figures for the companies for April and February. Only in the case of Shelby is the April figure greater than the February figure. Thus, the highest ratio has to be that of Shelby.

The correct answer is B.

8. The number of trousers manufactured in February and March by Caret = $850 + 950 = 1800$

The number of trousers manufactured in February and March by Wendy = $1150 + 1100 = 2200$

The number of trousers manufactured in February and March by Kooper = $1050 + 1050 = 2050$

The number of trousers manufactured in February and March Shelby = $700 + 800 = 1500$

The number of trousers manufactured in February and March by Prisma = $1050 + 800 = 1850$

The correct answer is D.

9. Only Sulpar and Sictor have more than doubled over the entire period.

Overall growth of Sulpar

$$= \left(\frac{438200}{194830} - 1 \right) \times 100 = 125\%$$

Overall growth of Sictor

$$= \left(\frac{2400}{1100} - 1 \right) \times 100 = 218.18\%$$

Therefore, Sictor experienced the second highest annual growth rate.

The correct answer is B.

10. Total number of two-wheelers on roads of the country in year 2007

$$= 1300 + 249200 + 42300 + 479200 + 172600 + 1600 + 137600 + 65000 + 14400$$

$$= 1163200$$

Total number of two-wheelers on roads of the country in year 2009

$$= 1900 + 325000 + 49200 + 416700 + 162400 + 3000 + 125700 + 68000 + 16500$$

$$= 1168400$$

$$\text{Required difference} = 1168400 - 1163200 = 5200$$

The correct answer is D.

11. Total number of RHONDA two-wheelers in the year 2008 = 403400

Total number of two-wheelers in the year 2008

$$= 1800 + 266000 + 43300 + 403400 + 150400 + 2300 + 121700 + 64900 + 15000 = 1068800$$

So, the required percentage

$$= \frac{403400}{1068800} \times 100 \times 100 = 37.74\% \approx 38\%$$

The correct answer is D.

12. From the explanation of the previous question, we have:

Total number of two-wheelers in the year 2008

$$= 1068800$$

Therefore, average number of two-wheelers in the year 2008

$$= \frac{1068800}{9} = 118756$$

The correct answer is A.

13. Percentage of students securing more than 60% marks in aggregate
 $= \frac{270}{1000} \times 100 = 27\%$

And percentage of students securing more than 40% marks is =
 $\frac{730}{1000} \times 100 \times 100 = 73\%$

$$\text{Hence, the difference} = 73\% - 27\% = 46\%$$

The correct answer is C.

14. The number of students securing more than 20 marks in English = 800

The number of students securing 40 marks in Computer Science cannot be determined from the given information.

The correct answer is E.

15. Number of students securing more than 60% in computers is 210 and number of students securing more than 40% in aggregate is 730.

$$\text{So, the required percentage} = \frac{210}{730} \times 100 \times 100$$

$$= 28.67\% = 29\%$$

The correct answer is B.

16. By the close observation of the table, we see that the sale for the men's section of Olivestyle increases only in the year 2008 (17.2 million dollars to 18.5 million dollars). For the rest of the years the sale decreases.

The correct answer is D.

17. Total sales of men's section of three stores in year 2005

$$= 13.5 + 21.5 + 4.3 = 39.3 \text{ million dollars}$$

Percentage related to total sales

$$= \frac{39.3}{112.7} \times 100 = 34.87\%$$

Total sales of men's section of three stores in year 2006

$$= 12.5 + 18.5 + 5.4 = 36.4 \text{ million dollars}$$

Percentage related to total sales

$$= \frac{36.4}{114.1} \times 100 = 31.90\%$$

Total sales of men's section of three stores in year 2007

$$= 9.8 + 17.2 + 8.6 = 35.6 \text{ million dollars}$$

Percentage related to total sales

$$= \frac{35.6}{121.7} \times 100 = 29.25\%$$

Total sales of men's section of three stores in year 2008

$$= 11.5 + 18.5 + 11.2 = 41.2 \text{ million dollars}$$

Percentage related to total sales

$$= \frac{41.2}{103.6} \times 100 = 31.54\%$$

Total sales of men's section of three stores in year 2009

$$= 12.5 + 15.4 + 9.5 = 37.4 \text{ million dollars}$$

Percentage related to total sales

$$= \frac{37.4}{134.8} \times 100 = 27.74\%$$

Therefore, years 2005, 2006 and 2008 represent total sale of men's section between 30% and 40% of the total sale.

The correct answer is D.

18. The percentage growth in the sales of all three stores together in 2006

$$= \frac{114.1 - 112.7}{112.7} \times 100 = 1.24\%$$

The percentage growth in the sales of all three stores together in 2007

$$= \frac{121.7 - 114.1}{114.1} \times 100 = 6.66\%$$

The percentage growth in the sales of all three stores together in 2008

$$= \frac{130.6 - 121.7}{121.7} \times 100 = 7.31\%$$

The percentage growth in the sales of all three stores together in 2009

$$= \frac{134.8 - 130.6}{130.6} \times 100 = 3.21\%$$

Hence, the highest percentage growth in the sales of all three stores together, relative to the previous year, was achieved in 2008.

The correct answer is D.

19. Option A:

Total sales of the men's section of Topper's Top across all the years
= 59.8

Total sales of the women's section of Topper's Top across all the years = 70.4

Total sales of the other's section of Topper's Top across all the years
= 109.9

Clearly, percentage of other's section is less than 50%.

So, option A is incorrect.

Option B:

Sales of the women's section of Topper's Top increases from 2006 to 2009.

So, option B is incorrect.

Option C:

The men's section sales at Oliveside are always the highest among all three stores.

So, option C is incorrect.

Option D:

Average of all three sections in the year 2005

$$= \frac{4.3 + 6.5 + 6.5}{3} = 5.76$$

Average of all three sections in the year 2006

$$= \frac{5.4 + 7.5 + 7.2}{3} = 6.7$$

Average of all three sections in the year 2007

$$= \frac{8.6 + 9.2 + 6.8}{3} = 8.2$$

Average of all three sections in the year 2008

$$= \frac{11.2 + 10.8 + 6.5}{3} = 9.5$$

Average of all three sections in the year 2009

$$= \frac{9.5 + 11.8 + 7.5}{3} = 9.6$$

Clearly, the women's section sales at Eastside have always been higher than the average sales of all three sections at Eastside.

Option E:

The 'Others' section sales of Eastside are always the lowest among all three stores.

So, option E is incorrect.

The correct answer is D.

20. Total number of science and engineering doctorates from India in 1989 = 4209

Total number of engineering doctorates from India in 1989 = 586

Total number of science doctorates from India in 1989 = 4209 – 586
= 3623

Total number of science and engineering doctorates from India in 1991 = 4294

Total number of engineering doctorates from India in 1991 = 629

Total number of science doctorates from India in 1989 = 4294 – 629
= 3665

Required percentage

$$= \frac{3665 - 3623}{3623} \times 100$$

$$= \frac{42}{3623} \times 100 = 1.16\%$$

The correct answer is A.

- 21.** Total number of science and engineering doctorates from Asia in 1993 = 12587

Total number of engineering doctorates from Asia in 1993 = 4700

Total number of science doctorates from Asia in 1993 = 12587 – 4700 = 7887

Total number of science and engineering doctorates from India in 1993 = 4320

Total number of engineering doctorates from India in 1993 = 323

Total number of science doctorates from India in 1993 = 4320 – 323 = 3997

Required percentage

$$= \frac{3997}{7887} \times 100 = 50.67\%$$

The correct answer is D.

- 22.** Percentage increase in the number of engineering doctorates from 1989 to 2003 in China

$$= \frac{6573 - 726}{726} \times 100$$

$$= \frac{5847}{726} \times 100 = 805.37\%$$

Percentage increase in the number of engineering doctorates from 1989 to 2003 in India

$$= \frac{779 - 586}{586} \times 100$$

$$= \frac{193}{586} \times 100 = 32.93\%$$

Percentage increase in the number of engineering doctorates from 1989 to 2003 in Japan

$$\begin{aligned} &= \frac{3921 - 1774}{1774} \times 100 \\ &= \frac{2147}{1774} \times 100 = 121.02\% \end{aligned}$$

Percentage increase in the number of engineering doctorates from 1989 to 2003 in South Korea

$$\begin{aligned} &= \frac{1868 - 415}{415} \times 100 \\ &= \frac{1453}{415} \times 100 = 350.12\% \end{aligned}$$

Percentage increase in the number of engineering doctorates from 1989 to 2003 in Taiwan

$$\begin{aligned} &= \frac{656 - 120}{120} \times 100 \\ &= \frac{536}{120} \times 100 = 446.67\% \end{aligned}$$

Hence, India recorded the least percentage increase in the number of engineering doctorates from 1989 to 2003.

The correct answer is A.

Alternatively,

From the figures of 1989 and 2003, we can easily understand that except India, the figures for the rest of the countries are more than doubled.

Therefore, least percentage increase in the number of engineering doctorates was in India only.

23. From 1989 to 1993 number of Engineering doctorates from Asia

$$= 3621 + 4100 + 4700 = 12421$$

From 1989 to 1993 number of Engineering doctorates from India

$$= 586 + 629 + 323 = 1538$$

From 1989 to 1993 number of Engineering doctorates from Asia other than India

$$= 12421 - 1538 = 10883$$

From 1989 to 1993 percentage of Engineering doctorates from Asia were from countries other than India

$$= \frac{10883}{12421} \times 100 = 87.61\%$$

The closest option is 88.91%.

The correct answer is E.

General Solution for Questions 24 to 27:

Uruguay has not won any matches so far which means point scored by the team is only from draws.

Brazil has scored same number of goals as the team scored against it means any number loss for Brazil will be accompanied by a win to equalise the number of goals. Draws has equal number of goals already.

Point scored by Argentina is 5 and atmost a team win 3 matches. So, we are left with only one combination of 2 wins and 1 draw.

Paraguay has not drawn or won any matches because its total score is 0.

Each team can play against other atmost once and both Uruguay and Paraguay haven't won any matches and Paraguay also hasn't played any draw which means both didn't play against each other.

So, the final fixtures of points by these teams will be as below:

$$\text{Argentina} = \text{Win} + \text{Win} + \text{Draw} = 5$$

$$\text{Uruguay} = \text{Draw} + \text{Draw}$$

Argentina has played 3 matches, 1 against each and won 2 matches and drawn one which means a win against Paraguay, a draw against Uruguay and a win against Brazil.

A loss for Brazil must be accompanied by a win for Brazil to equalise the goals. As Uruguay & Paraguay hasn't played against each other, so, it must have won against Paraguay and drawn with Uruguay to finalise the fixture.

Therefore, the final table can be drawn as below:

Country	Total Match Played	Status	Points
Brazil	3	Win + Loss + Draw	3
Argentina	3	Win + Win + Draw	5
Uruguay	2	Draw + Draw	2
Paraguay	2	Loss + Loss	0

Now all the questions can be solved easily.

- 24.** From the above table, we have:

Number of draw matches = 2

The correct answer is C.

- 25.** From the above table, we have:

Number of teams which played 3 matches = 2

The correct answer is C.

- 26.** From the above table, we have:

Point of Brazil = 3

The correct answer is C.

- 27.** From the above table, we have:

The number of drawn matches played by Brazil = 1

And, the number of drawn matches played by Argentina = 1

Therefore, required difference = 0

The correct answer is A.

28. Total number of students in college C

$$= 60 + 60 + 50 = 170$$

Number of students who got selected during campus placement drives

$$= 24 + 30 + 40 = 94$$

Required percentage

$$= \frac{94}{170} \times 100 = 55.29\%$$

The correct answer is C.

29. Total number of Mechanical Engineering students from all the colleges

$$= 60 + 60 + 60 + 60 + 60 = 300$$

Number of students who are selected during campus placement drives

$$= 40 + 30 + 24 + 35 + 18 = 147$$

Required percentage

$$= \frac{147}{300} \times 100 = 49\%$$

The correct answer is C.

30. Total number of Electrical Engineering students from all the colleges who got selected during campus placement drives

$$= 24 + 36 + 30 + 18 + 12 = 120$$

The correct answer is C.

5 DI-Graphs and Charts

1. The mode of a list of numbers is the number that occurs most frequently in the list. In the bar graph for GPA, dark gray bars represent the students in 2010, and the mode of that data set is indicated by the tallest dark gray bar. This is at grade point average of 3.3. There were 625 students with a grade point average of 3.3 in the year 2010, more students than had any other grade point average.

The correct answer is B.

2. The median is the 'middle value' of an ordered list of numbers, dividing the list into roughly two equal parts. For the 3,000 students in 1980, the median GPA is the average of the 1,500th and the 1,501st highest GPA. The students in 1980 are represented by the light gray bars.

150 students had a 4.0 GPA.

225 students had a 3.7 GPA.

(Total with this GPA and higher = $150 + 225 = 375$)

300 students had a 3.3 GPA.

(Total with this GPA and higher = $375 + 300 = 675$)

450 students had a 3.0 GPA.

(Total with this GPA and higher = $675 + 450 = 1,125$)

475 students had a 2.7 GPA.

(Total with this GPA and higher = $1,125 + 475 = 1,600$)

The 1,500th and 1,501st students fall between the 1,125th and 1,600th students. Thus, the 1,500th and 1,501st highest grade point averages are both 2.7.

The correct answer is D.

3. In 2010,

350 students had a 4.0 GPA.

525 students had a 3.7 GPA.

625 students had a 3.3 GPA.

500 students had a 3.0 GPA.

Thus, there were $350 + 525 + 625 + 500 = 2000$ students who earned at least a 3.0 GPA in the year 2010, out of a total of 3000 students. This is $\frac{2}{3}$ of the students, or about 67% of the students.

The correct answer is C.

4. In 1980,

150 students had a 4.0 GPA.

225 students had a 3.7 GPA.

300 students had a 3.3 GPA.

450 students had a 3.0 GPA.

In 1980, $150 + 225 + 300 + 450 = 1,125$ students had a GPA of 3.0 or higher.

Thus, $3,000 - 1,125 = 1,875$ students earned a GPA less than 3.0.

As a percent of the class, this was $\left(\frac{1875}{3000}\right) \times 100 = 62.5\%$

The correct answer is D.

5. Note that there are 5 vertical grid lines for every 10 players, so each vertical grid line accounts for 2 players. On the Athletics team, there are between 36 and 38 men (so it must be 37) represented by the light gray bar. On the Athletics team, there are between 60 and 62 women (so it must be 61) represented by the dark gray bar. In fractional form, the required ratio = $\frac{37}{61}$

The correct answer is A.

6. Note that there are 5 vertical grid lines for every 10 players, so each vertical grid line accounts for 2 players.

Male athletes are represented by the light gray bars for each sport.
Sum the male athletes on each of the separate teams.

Males on Volleyball team: 0

Males on Athletics team: 37

Males on Tennis team: 9

Males on Football team: 10

Males on Cricket team: 17

Males on Basketball team: 14

There are $0 + 37 + 9 + 10 + 17 + 14 = 87$ male players in all of the teams combined, but there are only a total of 76 male players. Thus, there must be $87 - 76 = 11$ male players who are counted twice by being on both the Athletics and Cricket teams.

The correct answer is A.

7. A sport in which male players outnumber female players will have a shorter dark gray bar than a light gray bar. This is only the case for Football, where there are 10 male players and 7 female players.

The correct answer is D.

8. There are 9 female tennis players and 14 male basketball players.
Thus, the required ratio = 9 : 14

The correct answer is B.

9. The population of B in 2005 = $5000 \times \frac{16}{13}$ = approximately 6150

The population of B in 2006 = $6150 \times \frac{16}{13}$

= approximately 6750

The population below poverty line = 52% of 6750

= approximately 3500

The correct answer is C.

10. The population of Town D in 2005

$$= 9000 \times \frac{17}{15} = 10200$$

The population of Town D in 2007

$$= 10200 \times \frac{110}{100} = 11220$$

The population of Town G in 2007

$$= 9000 \times \frac{95}{100} = 8550$$

Therefore, the required total

$$= 11220 + 8550 = 19770$$

The correct answer is B.

11. The population of Town F below the poverty line =
$$\frac{55000}{100} \times \frac{13}{100} \times \frac{49}{100} = 3500$$

The correct answer is C.

12. The population of Town C below the poverty line

$$= 2000 \times \frac{38}{100} = 760$$

The population of Town E below the poverty line

$$= \frac{2000}{8} \times 18 \times \frac{46}{100} = 2070$$

Therefore, the required ratio = $\frac{760}{2070}$
= $\frac{76}{207}$

The correct answer is B.

Alternatively,

We do not need to know the population of any town to solve this question.

Required ratio = $(8 \times 38) : (18 \times 46) = 76 : 207$.

General Solution for Questions 13–16:

Here we are given the percentage of students who like science in fig 1 and total number of students surveyed in fig 2. Using the two figures, we can compute the number of students who like science for all 5 countries for 1998 and 2008 as below.

Number of students who like science:

Country	1998	2008
A	60% of 6,000	60% of 4,000
B	40% of 2,000	50% of 3,000
C	45% of 5,000	30% of 1,000
D	40% of 6,000	20% of 4,000
E	10% of 2,000	35% of 5,000

Country	1998	2008
A	3,600	2,400
B	800	1,500
C	2,250	300
D	2,400	800
E	200	1,750
Total	9,250	6,750

13. From the table we made earlier, we know that the total number of students who like science was 9,250 in 1998 and 6,750 in 2008

Percentage decrease between 1998 and 2008

$$= \frac{(9,250 - 6,750)}{9,250} \times 100 = \frac{2,500}{9,250} \times 100 = 27.03\%$$

Now given that number of students who were surveyed and were loving science in 2010 was 8,450

So percentage increase from 2008 to 2010 is

$$= \frac{(8,450 - 6,750)}{6,750} \times 100 = \frac{1,700}{6,750} \times 100 = 25.19\%$$

The correct answer is E.

14. Total number of students surveyed in 1998 = 21,000

Number of students who liked science = 9,250

Number of students who did not like science

$$= 21,000 - 9,250 = 11,750$$

Number of students surveyed who liked science in 2000 = 11,750 + 10% of 11,750

$$= 11,750 + 1,175 = 12,925$$

Now, we consider these 12,925 students make a universal set where

A = set of students who like Physics, A^c

= complement of set A that is those students who don't like Physics

B = set of students who like Chemistry, B^c

= complement of set B that is those students who don't like Chemistry

C = set of students who like Biology, C^c

= complement of set C that is those students who don't like Biology

$$n(A \cup B \cup C) = n(A \cap B^c \cap C^c) + n(B \cap C^c \cap A^c) + n(C) + n(A \cap B \cap C^c)$$

$$12,925 = 2,000 + 4,346 + 5,579 + n(A \cap B \cap C^c)$$

$$n(A \cap B \cap C^c) = 1,000$$

So, number of students who like both Physics and Chemistry but not Biology is 1,000.

The correct answer is B.

15. Difference between students who like science in 1998 and 2008 =
 $9,250 - 6,750 = 2,500$

Sample size of survey conducted in country F in 2010 is 2,500

The correct answer is A.

16. The total number of students surveyed in the five countries in 1998 who liked science:

Country A: 3,600; Country B: 800; Country C: 2,250; Country D: 2,400; Country E: 200

The total number of students surveyed in the five countries in 2008 who liked science:

Country A: 2,400; Country B: 1,500; Country C: 300; Country D: 800; Country E: 1,750

% decrease for:

Country A = 33.33%; Country B = 87.5%; Country C = 86.67%; Country D = 66.67%; Country E = 77.5%

Only Country A recorded a percentage change of less than 50%. Hence, only Country A was surveyed for a second time in 2008. For the same population surveyed, correct number of Country A students who liked science in 2008 = $2400 - 900 = 1500$.

$$\text{Percentage error} = 900 \times \frac{100}{1,500} = 60\%$$

The correct answer is B.

General Solution for Questions 17–19:

Number of employees in 2013

$$= 2000 - 250 + 350 = 2100$$

Number of employees in 2014

$$= 2100 - 450 + 300 = 1950$$

Number of employees in 2015

$$= 1950 - 300 + 400 = 2050$$

Number of employees in 2016

$$= 2050 - 250 + 500 = 2300$$

Number of employees in 2017

$$= 2300 - 400 + 350 = 2250$$

17. Number of employees in 2012 = 2000

Change in number of employees in 2013

$$= 350 - 250 = 100$$

So, the required percentage change

$$= \frac{2100 - 2000}{2000} \times 100 = 5\%$$

The correct answer is D.

18. Looking at the above calculation, it is clear that the number of employees in ABC Pvt. Ltd. was the maximum in the year 2016.

The correct answer is C.

19. Looking at the above calculation, it is clear that none of the given two years has the number of employees in ABC Pvt. Ltd. the same.

The correct answer is E.

20. Total volume of sales in the year 2011

$$= 405 \times 150 = 60750$$

Total volume of sales in the year 2015

$$= 370 \times 265 = 98050$$

Hence, the required percentage

$$= \frac{98050 - 60750}{60750} \times 100 = \frac{3730}{6075} \times 100 = 61.4\%$$

The correct answer is D.

21. Average of the volume of cars sold

$$= \frac{405 + 325 + 370 + 380 + 265 + 340 + 160}{7}$$
$$= \frac{2245}{7} = 320.71$$

Average of the sales per unit volume

$$= \frac{150 + 170 + 270 + 320 + 370 + 365 + 320}{7}$$
$$= \frac{1965}{7} = 280.71$$

Therefore, the required difference

$$= 320.71 - 280.71 = 40$$

The correct answer is A.

22. This happens only in the duration 2011 – 2012, 2014 – 15 and 2015 – 2016. In rest of the duration the trend in both are same.

The correct answer is C.

23. If the points A,O and B are joined together then,

Total tax levied by government = 50%

School + Libraries = 50%

46.6% + Libraries = 50%

Libraries = 50 – 46.6 = 3.4%

Tax levied = 3.4% of 16.6 million dollars

$$= \frac{3.4}{100} \times 16.6 \times 10^6 = 564400 \text{ dollars}$$

The correct answer is C.

24. Tax levied on School, Libraries and Counties = 75%

Tax levied on Other units, Townships and Cities and Towns = 25%

$$\begin{aligned}\text{Tax levied} &= 25\% \text{ of } 16.6 \text{ million dollars} \\ &= \frac{25}{100} \times 16.6 \times 10^6 = 4150000 \text{ dollars}\end{aligned}$$

Tax levied on Other units

= Tax levied on Other units, Townships and Cities and Towns – Tax levied on Townships and Cities and Towns

$$= 4150000 - 3652000 = 498000 \text{ dollars}$$

The correct answer is A.

- 25.** Tax levied on School and Libraries = 50%

Therefore, Tax levied on Counties

$$\begin{aligned}&= \frac{1}{2} (\text{Combine tax on School \& Libraries}) \\ &= \frac{1}{2} \times 50 = 25\%\end{aligned}$$

Tax levied on Counties

$$\begin{aligned}&= 25\% \text{ of } 16.6 \text{ million dollars} \\ &= \frac{25}{100} \times 16.6 \times 10^6 = 4150000 \text{ dollars}\end{aligned}$$

The correct answer is D.

- 26.** Tax levied on Cities and Towns

$$= 6 \times \text{Tax levied on other units}$$

$$\text{Tax levied on other units} = 498000 \text{ dollars}$$

Tax levied on Cities and Towns

$$= 6 \times 498000 = 2988000 \text{ dollars}$$

Tax levied on Cities and Towns

$$= 4.5 \times \text{Tax levied on Township}$$

$$\text{Tax levied on Township} = \frac{2988000}{4.5} = 664000$$

Percentage of tax levied on Township relative to total tax levied

$$= \frac{664000}{16.6 \times 10^6} \times 100 = 4\%$$

The correct answer is B.

27. Number of persons whose age is between 50–59

$$= 15\% \text{ of } 2000 = 300$$

Number of persons whose ideal body mass index age between 50–59

$$= 50\% \text{ of } 300 = 150$$

Number of persons whose age is between 60–69

$$= 10\% \text{ of } 2000 = 200$$

Number of persons whose ideal body mass index age between 60–69

$$= 10\% \text{ of } 200 = 20$$

People who were 50 years and above had an ideal body mass index

$$= 150 + 20 = 170$$

The correct answer is B.

28. Number of people whose age is between 20–29

$$= 25\% \text{ of } 2000 = 500$$

Number of people who did not have an ideal body mass index age is between 20–29

$$= 20\% \text{ of } 500 = 100$$

Number of people whose age is between 30–39

$$= 30\% \text{ of } 2000 = 600$$

Number of people who did not have an ideal body mass index age is between 30–39

$$= 60\% \text{ of } 600 = 360$$

Number of people below 40 years did not have an ideal body mass index

$$= 360 + 100 = 460$$

The correct answer is A.

29. Number of people from age group of 20–29 who took the survey were obese = 0

Number of people from age group of 30–39 who took the survey were obese

$$= 10\% \text{ of } 30\% \text{ of } 2000$$

$$= \frac{10}{100} \times \frac{30}{100} \times 2000 = 60$$

Number of people from age group of 40–49 who took the survey were obese

$$= \frac{30}{100} \times \frac{20}{100} \times 2000 = 120$$

Number of people from age group of 50–59 who took the survey were obese

$$= 20\% \text{ of } 15\% \text{ of } 2000$$

$$= \frac{20}{100} \times \frac{15}{100} \times 2000 = 60$$

Number of people from age group of 60–69 who took the survey were obese

$$= 40\% \text{ of } 10\% \text{ of } 2000$$

$$= \frac{40}{100} \times \frac{10}{100} \times 2000 = 80$$

Total number of people who took the survey were obese

$$= 60 + 120 + 60 + 80 = 320$$

Percentage of people who took the survey were obese

$$= \frac{320}{2000} \times 100 = 16\%$$

The correct answer is B.

- 30.** Total number of overweight people in the age group of 20–29 = 0

Total number of overweight people in the age group of 30–39

= 40% of 30% of 2000

$$= \frac{40}{100} \times \frac{30}{100} \times 2000 = 240$$

Total number of overweight people in the age group of 40–49

= 20% of 20% of 2000

$$= \frac{20}{100} \times \frac{20}{100} \times 2000 = 80$$

Total number of overweight people in the age group of 50–59

= 30% of 15% of 2000 = 90

Total number of overweight people in the age group of 60–69

= 50% of 10% of 2000

$$= \frac{50}{100} \times \frac{10}{100} \times 2000 = 100$$

Total number of overweight people

$$= 0 + 240 + 80 + 90 + 100 = 510$$

Required percentage

$$= \frac{90}{510} \times 100 = 17.65\%$$

The correct answer is B.

6 Data Sufficiency

1. From statement (1), we have

$$ab = 8$$

The possible scenarios satisfying the above equation are as follows:

$$1 \times 8 = 8$$

$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

$$8 \times 1 = 8$$

This information alone is not sufficient to calculate the values of a, b and c.

From statement (2), we have

$$bc = 9$$

The possible scenarios satisfying the above equation are as follows:

$$1 \times 9 = 9$$

$$3 \times 3 = 9$$

$$9 \times 1 = 9$$

This information alone is not sufficient to calculate the values of a, b and c.

However, if we combine the information from both the statements, we get $a = 8$, $b = 1$ and $c = 9$.

The correct answer is C.

2. From statement (1), we have

$$\frac{P}{Q} = \frac{3}{5}$$

This information alone is not sufficient to calculate the value of Q.

From statement (2), we have

$$\frac{P}{Q} = \frac{6}{20} = \frac{3}{10}$$

This information is contradictory to the information given in (1). Also, (2) alone is not sufficient to calculate the value of Q.

Thus, the information from (1) and (2), when combined together is not sufficient to calculate the value of Q.

The correct answer is E.

3. Since we don't have the total number of people given to us, or the ratio of men to women, we cannot arrive at the answer even by combining both the statements.

The correct answer is E.

4. If $\frac{2}{5}$ of the students are boys, this means that $\frac{3}{5}$ of the students are girls. So the required probability is $\frac{3}{5}$. Statement 1 is sufficient.

Statement 2 does not help since we don't know the total number of students in the class.

The correct answer is A.

5. We need to know the Total Distance covered in order to calculate the Average Speed.

Since neither of the statements alone or together tells us anything about the total distance travelled, the correct answer should be Option E.

The correct answer is E.

6. Statement 1: Since $a + 2$ is even, a is an even integer, and therefore $a + 1$ would be an odd integer; Statement I is Sufficient

Statement 2: Since $a - 1$ is an odd integer, a is an even integer. Therefore $a + 1$ would be an odd integer; Statement II is Sufficient.

The correct answer is D.

7. From statement 1, Let Udit's earning last month be x

$$\text{Then } \frac{1}{4} \times \frac{1}{2}x = 1200$$

By solving the above equation, we will get Udit's earnings for the last month; Sufficient. (Remember, you do not need to try to solve this equation, it will only waste your time).

Statement 2 just tells us the relation between Udit's savings and his rent, which does not tell us anything about his overall earnings. So, the statement 2 is Insufficient.

The correct answer is A.

8. From Statement 1, the original amount of water in the pool is irrelevant, since we only have to figure out the rate of increase. So, Statement 1 is Not Sufficient

From Statement 2, water is being pumped in at 50 litres per minute and pumped out at $\frac{20}{4} = 5$ litres per minute. Thus, the net rate of addition = $50 - 5 = 45$ litres per minute. So Statement 2 ALONE is sufficient.

The correct answer is B.

9. Using statement 1 alone, we can say that the price of coffee = $x+5$, where x is the price of tea.

Using statement 2 alone, we know that the price of coffee = $3x-5$, where x is the price of tea.

Combining both the statements, we have

$$x + 5 = 3x - 5$$

$$2x = 10 \Rightarrow x = 5$$

The correct answer is C.

10. You don't need to actually calculate the 7th and 22nd roots of y ; doing so will only waste your time. However, the important thing to note is that you will get a unique value for y from either of the two

given statements. What that value is does not matter to you. Thus, the answer is D.

The correct answer is D.

11. You know that in a triangle, the largest angle lies opposite to the longest side. So all we need to figure out is which of the three sides is the longest.

From Statement 1, AC is the longest side, so it is Sufficient.

From Statement 2, we still don't have a value for y . So it is NOT Sufficient.

The correct answer is A.

12. You can't do anything with either of the two statements because the total number of students is not given to you, neither is the ratio of Indian to non-Indian students given.

The correct answer is E.

13. Statement 1 is not sufficient since it does not provide us with the Common difference.

Statement 2 is Sufficient because it provides us with the common difference (18) and also with one specific term.

The correct answer is B.

14. The two statements simply give the cost price of the two types of tea. However, from the cost price we cannot get any idea of the selling price. Thus, both the statements together are Not Sufficient to answer the question asked.

The correct answer is E.

15. Using statement 1 alone — as coordinates of all the vertices are given, so each side and both diagonals can be obtained and using them, area of quadrilateral can be obtained (by considering it as 2 triangles and for each triangle 2 sides are adjacent sides of

quadrilateral and 3rd side for both is the same diagonal). Therefore, statement 1 alone is sufficient.

Using statement 2 alone — the given information is inadequate to find the area of the quadrilateral

The correct answer is A.

16. Let the number be xy .

Then, the number can be represented as $10x + y$ and the number formed by reversing the digits can be represented by $10y + x$.

From statement 1:

$$D = |(10x + y) - (10y + x)| = 36$$

$$\Rightarrow |9(x - y)| = 36$$

$$\Rightarrow |x - y| = 4$$

$$\Rightarrow x - y = \pm 4$$

Hence, the question cannot be answered using statement 1 alone.

From statement 2:

$$x + y = 12$$

Hence, the question cannot be answered using statement 2 alone.

Combining statements 1 and 2:

Clearly, the number could be 48 or 84 and hence, a unique number cannot be determined by combining the statements 1 and 2.

So, both the statements are not sufficient.

The correct answer is E.

17. From Statement 1:

Using the first statement one can deduce that $A > D > F$ such that F is taller than at least one person, either B or E.

Hence, the question cannot be answered using statement 1 alone.

From Statement 2:

Using the second statement one can deduce that $B > E$.

Hence, the question cannot be answered using statement 2 alone.

Combining statements 1 and 2:

Combining both the statements we can deduce that F is greater than both B and E and, hence, E is the smallest.

So, the question can be answered using both the statements.

The correct answer is C.

18. Divisibility rule of 9 says that a number is divisible by 9 if sum of digits is divisible by 9. So, as per statement 1, the number abc is a multiple of 9 and so sum of digits is also divisible by 9.

So, $a + b + c$ is divisible by 9.

Hence, statement 1 alone is sufficient.

Statement 2 is not sufficient since choosing $a = 0 = b$ and $c = 9$ makes it valid and $(a + b + c)$ is 9 but choosing $a = 4 = b$ and $c = 2$ also makes it valid with $(a + b + c)$ equal to 10, which is not divisible by 9.

The correct answer is A.

19. Each statement independently gives the answer.

$\sqrt{9}$ gives + 3 and not -3. By convention we always take a positive root only.

The second statement gives the value of X as 0.

The correct answer is C.

20. Statement 1 is true for parallelogram, rectangle as well as a rhombus.

So, statement 1 alone is not sufficient.

From statement 2, sum of AB + CD is equal to sum of AD + BC.

Since AB = CD and AD = BC (in a parallelogram), we can say that AB = BC = CD = DA, and so the parallelogram is a rhombus.

Hence, statement 2 alone is sufficient to determine the nature of ABCD.

The correct answer is B.

21. Using statement 1

$$a^2 + b^2 + c^2 = ab + bc + ca$$

$$\text{or } a^2 + b^2 + c^2 - ab - bc - ca = 0$$

$$\text{or } \frac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2] = 0$$

$$\Rightarrow a = b = c$$

Therefore, we cannot say that $a = b = c = 1$

Hence, statement 1 alone is not sufficient to answer the question.

Using statement 2

From equation $a^2 + b^2 = 2c^2$, we cannot say that a, b and c are definitely equal to 1. They could be equal to 2, 3, 4 and so on.

Hence statement 2 alone is also not sufficient to answer the question.

Combining both the statements also we cannot find the definite answer.

The correct answer is E.

22. Using statement 1

Let the total capacity of the tank be $V \text{ cm}^3$.

Fraction of the total volume of the tank filled in 2 hours when both the pipes are opened together

$$= 2\left(\frac{1}{6} + \frac{1}{8}\right)$$

$$\text{So, volume of water in the tank} = 2\left(\frac{1}{6} + \frac{1}{8}\right)V$$

Since, the value of 'V' is not known, hence statement 1 alone is not sufficient to answer the question.

Using statement 2

Obviously, this statement alone is not sufficient to answer the question.

Combining both the statement together, we get:

$$\text{Volume of water in the tank} = 2\left(\frac{1}{6} + \frac{1}{8}\right) \times 100$$

The correct answer is C.

23. Using statement 1

Nothing can be said about the schedule of Chemistry.

Using statement 2

Nothing can be said about the schedule of Chemistry.

Combining both the statement together, we get:

14th	15th	16th	17th
Monday	Tuesday	Wednesday	Thursday
Arithmetic	Dermatology	Biology	Chemistry

Hence, by using both the statements together, we can see that Chemistry was scheduled on Thursday.

The correct answer is C.

24. From statement 1:

Even numbers are those whose one common factor is 2. So, the square of an even numbers have a common factor 4.

Hence, A and B are not co-primes (co-prime number are those whose HCF is 1).

From statement 2:

HCF of two prime numbers is always 1. So, A and B are co-prime numbers.

Hence, each statement alone is sufficient to answer the question.

The correct answer is D.

25. From statement 1:

$$x = \sqrt{4096} = 64$$

Statement 1 is sufficient to answer the question.

From Statement 2:

$$x^{64} = 8^{128} \text{ or } x = \pm 64$$

Statement 2 is not sufficient.

The correct answer is A.

26. From Statement 1:

3, 5 and 7 are the only set of 3 successive prime numbers which are in AP.

Therefore, statement 1 is sufficient to answer the question.

From Statement 2:

If the first prime number is 5 then the other two successive prime numbers are 7 and 11.

Therefore, Statement 2 is also sufficient to answer the question.

The correct answer is D.

27. Let the kashyap's salary be \$ x .

From statement 1:

Price of 50 kg of rice = $\$ \frac{x}{4}$

So, statement 1 alone is not sufficient.

Reduced price of 50 kg of rice

$$= \frac{x}{4} - \frac{x}{4} \times \frac{20}{100} = \$ \frac{x}{5}$$

According to the question,

$$\begin{aligned} \frac{x}{5} &= \frac{x}{10} + 100 \\ \Rightarrow \frac{x}{5} - \frac{x}{10} &= 100 \\ \Rightarrow \frac{x}{10} &= 100 \\ x &= \$1000 \end{aligned}$$

Hence, both statements are necessary to answer the question.

The correct answer is C.

28. From Statement 1:

$$\begin{aligned} \log z^x &> \log z^{x^2} \\ x \log z &> x^2 \log z \end{aligned}$$

It is only possible when $0 < z < 1$

Statement 1 is sufficient to answer the question. From Statement 2:

$$z^2 < z$$

It is only possible when $0 < z < 1$

Statement 2 is sufficient to answer the question. Hence, each statement alone is sufficient to answer the question.

The correct answer is D.

29. Statement 1 does not say anything about the Rs. 5 coin.

Therefore, statement 1 is not sufficient to answer the question.

From statement 2:

Total outcome = 23

Favourable outcome = 8

$$\text{Probability} = \frac{\text{Favourable Outcome}}{\text{Total Outcome}} = \frac{8}{23}$$

Hence, statement 2 alone is sufficient to answer the question.

The correct answer is B.

30. From Statement 1:

$$\frac{x^2}{y^2} = \frac{1}{4} \Rightarrow y^2 = 4x^2$$

The given expression becomes:

$$\frac{x^3}{4x^2 + 1}, \text{ whose unique value cannot be calculated.}$$

So, statement 1 alone is not sufficient.

From statement 2:

$$y = 2x$$

Putting in the given expression, we get:

$$\frac{x^3}{4x^2 + 1}, \text{ whose unique value cannot be calculated.}$$

So, statement 2 alone is also not sufficient.

Combining the two statements does not help us either.

The correct answer is E.

4.0 Language Skills Review

4.0 Language Skills Review

This section provides a comprehensive review of the key language concepts assessed in the NMAT by GMAC™ exam. These concepts are elucidated with the help of several examples. It is recommended that you review the concepts and practice the different examples to build proficiencies.

The Language Skills section of the NMAT by GMAC™ exam will test you on the following broad areas:

1. Reading Comprehension
2. Para Forming
3. Error Identification
4. Prepositions
5. Sentence Completion
6. Analogies

The next few sections will explain some of the important strategies to approach each of these question types and include some practice questions at the end.

4.1 Top Tips to Prepare for Language Skills

1. You will get **36 questions** in the Language Skills section on the NMAT by GMAC™ exam that you will have to attempt in **28 minutes**.
2. This section will test your application of all three areas of English—vocabulary, grammar and comprehension.
3. Manage your time carefully. You have an average of 40 seconds per question, but you will need some more time while attempting Reading Comprehension questions. So, your target should be 30 seconds each for the rest of the questions, which will give you around 8–10 minutes to attempt the 7–8 Reading Comprehension questions that will appear on the test.
4. Who does it make perfect?—ensure that you practice enough test questions to get your timing correct. This is particularly important for error identification and preposition questions as you will need to remember the important grammar rules.
5. More importantly, maintain an error log of your practice questions and go through it from time to time to identify and strengthen your weak areas.
6. To improve both your comprehension and vocabulary, start reading well-written books, or a good newspaper, every day. Pay special attention to the Editorial section of newspapers, which has the most enriching vocabulary.

7. Maintain a vocabulary diary. Write down any new word you come across while reading the newspaper, or attempting practice questions in this diary, and go through it every day.
8. Try to learn words and not just memorise them. Simply put, you should be aware of the usage of a word and not just its dictionary meaning.
9. Prefer quality over quantity. Instead of memorising 100 words haphazardly, learn the meaning of 20 words properly. Similarly, instead of practicing a huge number of questions, focus on a small number and try to understand why you are making the mistakes that you are making and how to correct them in subsequent practice sessions.
10. Pay close attention to the strategies given in the next few sections to help you make intelligent guesses about meaning and usage of words. With these strategies, you do not need to know the meaning of every word in the dictionary.
11. Make no assumptions and do not use any real-world knowledge, especially on Reading Comprehension questions.

4.2 Reading Comprehension

4.3 What is Measured?

The comprehension section will test your ability to read, comprehend and interpret unfamiliar content and to answer questions about the same.

You will be tested on your understanding of the English language, your ability to comprehend the meaning of words in a context and draw inferences.

4.4 Overall Test Taking Strategies

1. While reading passages, focus on the comprehension aspect and not on the speed aspect.
2. Do not panic if the passage looks lengthy or difficult to comprehend. To ensure you are able to make best use of time, make use of the strategies provided in the following section.
3. Try to make a passage map for every passage and predict the topic and purpose before you attempt the questions.
4. Do not use external knowledge to answer questions. Only answer on the basis of what is given in the passage.

Introduction

Comprehension or the ability to make sense of some randomly assigned block of text will primarily be tested on Reading Comprehension question type on the NMAT by GMAC™. Reading Comprehension (RC) questions will test you on your understanding or comprehension of unfamiliar texts from long passages. You will likely see one to two RC passages in the verbal section of the NMAT by GMAC™ with 5–10 questions asked from it. The passages are typically 375–450 words in length though they can at times be longer or shorter.

In Reading Comprehension, students have to read passage(s) and answer questions that follow the passages. This area tests the ability of the student to quickly grasp what is being said in the passage before answering the questions. Some of the questions test your ability to recognise implications and draw inferences. Others test your ability to understand and critique the ideas and information provided in the passage; while some might require an application of the logic used in the passage.

The difficulty level of the questions in the section can be easy/medium or difficult, with several questions being direct lifts from the passage. The trick lies in enhancing both the speed and range of your reading in order to be equipped with the skills required to attempt this paper.

Let us begin with a quick revision of the basics.

Speed reading

What is speed reading?

Speed reading is essentially a method of reading rapidly by taking in several words or phrases at a glance or by skimming. Speed reading increases the reading rate and furthers comprehension of the text.

Skimming and scanning

Skimming and scanning are two very different strategies for speed reading. They are each used for different purposes and they are not meant to be used all the time.

Skimming refers to looking only for the general or main ideas and works best with non-fiction (or factual) material. With skimming, your overall understanding is reduced because you don't read everything. You read only what is important to your purpose.

Unlike skimming, when scanning, you look only for a specific fact or piece of information without reading everything. You scan when you look for your friend's phone number in the telephone list, and for the sports scores in the newspaper. For scanning to be successful, you need to understand how your material is structured as well as comprehend what you read so you can locate the specific information you need. Scanning also allows you to find details and other information in a hurry.

Both these techniques allow you to enhance your reading speed. However, merely increasing one's reading speed is not enough. How do you raise your reading speed comfort level? First, you need to learn how to be uncomfortable! You need to enter your discomfort zone.

You know you're in your reading discomfort zone when you get an uneasy feeling when you're trying something new. Most new speed readers feel it the first few times they try to read fast and realise their comprehension isn't what it should be. This uneasiness is expected, necessary for the learning process, yet temporary. This is due to the fact that the human brain needs a little time to adapt to these increasing speeds

of comprehension and reading. Using this technique can help a person increase their comprehension and reading speed anywhere from 20 percent to a 100 percent.

Speed reading is about using reading strategies and also about having a speed reading mind-set. It means believing you can read faster and you will read faster. It means not being overly concerned about comprehension at first, but knowing that it will follow when your eyes become adept at picking up information in a new way.

If you find yourself in your discomfort zone and want to re-enter the comfort zone with faster speeds under your belt, here are a few ideas:

Skip small words

Each word requires a different amount of time to process. In fact, some words are so intuitive; they can be skipped without losing the meaning of the sentence. Most native English readers do this instinctively to some degree, but this technique can be improved through practice.

The underlining hand motion /pointer method

This is a great beginner technique to force your eyes to adapt to a faster reading speed. In this technique we use a pen/pencil to trace the words we are reading, at a slightly faster pace. The pen/pencil acts as a guide and forces your eyes to follow the words at an enhanced speed.

Eliminate vocalisation/sub-vocalisation

Vocalisation/Sub-Vocalisation refers to pronouncing the words while you read, either audibly or inaudibly. This habit is a problem because it invariably slows down your speed for a simple reason – your speed is now a function of how fast you read out the words, which will not exceed 200 words per minute; an average reading speed.

A simple exercise that an individual can try to stop subvocalising is to use their inner voice by humming or counting either in their head or out loud while reading at their normal rate. People will immediately notice that they can comprehend the text much faster even though their ability to subvocalise has been blocked.

Regression

The tendency to go back to the parts of the passage or re-read the text is called regression. Regression unnecessarily slows you down and also affects your comprehension as result of frequent jumps in your understanding while reading.

Readers should focus on reading a passage completely even though they feel that their concentration has temporarily wandered or they have missed something. Remember that the brain is very good at filling in learning gaps. Staying focused on the line of words that is currently being read before continuing can also increase their comprehension of the text and its meaning. Additionally, important concepts are frequently repeated in a text all the time. Reading and comprehension speed is cut down by at least 30 percent if a person stops or regresses more than two times in every row.

Vocabulary increase

Reading speeds and comprehension will increase if the reader takes time to understand the words that they are reading. If a person cannot understand the meaning of the words in a text, their reading speed will decline. This is because a reader will need to pause in order to figure out what they are reading. Additionally, understanding the meaning of words often requires a quick look in the dictionary.

Practice

A person cannot improve their comprehension and reading skills without constant practice. This is extremely important for a reader to continue developing his/her ability to comprehend more and read faster. The most effective way of achieving sufficient training in processing information and reading at a faster rate is to practice. One way to make reading practice more interesting is to find a text that a person likes to read. This step is also vital for training the reader's eyes to skim faster across a page. Finally, always bear in mind that there are no limits to how much a person can improve their reading comprehension and reading speed. All it takes is practice.

Eclectic reading

You must increase your scope of reading. Reading across areas is vital for competitive examinations. Familiarity with different topics would help you comprehend the passage easily and would provide you a cutting edge in solving Reading Comprehension questions.

Active reading

To make the most of time you spend studying, you need to read actively.

Active reading simply means reading something with a determination to understand and evaluate it for its relevance to your needs. It is different from passive reading. It is an important skill that aids your comprehension. An active reader applies certain questions and theories that help enhance clarity. It involves applying logical and rhetorical skills.

If you just read passively, then you are dealing only with the superficial aspect of the text. This allows you to answer certain types of questions. But typical RC passages represent a wide variety of questions and in order to tackle all of them you need the ability to read critically.

Active reading enables a reader to comprehend the underlying structure – tone, inference and organisation that allows him/her to answer all types of questions.

Try these techniques to make your reading active:

Keywords

Make note of key words and phrases as you read. This will assist you in identifying the ideas and developing an ability to understand the link between them. Some ways to identify these are –

Correlating sets of words

Correlating words refer to the use of synonyms, antonyms, nouns, adverbs, verbs and adjectives to describe ideas and/or arguments in the passage. Identifying the related words helps you come closer to the main idea of the passage. Be selective - too much highlighting won't help.

Connecting words and their function

Certain words function as a link between various ideas expressed by the author. These words are of high importance as they bring out the contrast /link between the ideas, opinions and thoughts expressed in the passage. Link words are many and can be categorised in terms of the function they serve in the overall progression of the thought process. Some of these are:

Cause – Because, Thereby

Consequence – Thus, Therefore

Time Sequence – While, When

Concession – Nevertheless, However

Opposition – But, Against

Ideas that recur

Just like similar words are used to re-emphasize an idea, ideas reappearing in a passage reiterate a point. Authors use this technique to build the main idea or concept. This skill, to realise when an idea is being reiterated through examples, analogies and highlighting different aspects of the same phenomenon etc... is critical to getting close to the main idea of the passage. Look for “guiding words/phrases” that help you understand the text - phrases like ‘most importantly’, ‘in contrast’, ‘on the other hand’ and so on.

Analyse the argument

While reading, use the margins to make notes - you may do so by paraphrasing the key points, question the author's claims, jot down data, examples or important information and so on. Since this process requires a more in-depth interaction with the passage, your retention and understanding will be enhanced.

Critically analyse the text by asking questions such as - When and by whom was the text written? Who was the target audience and so on.

Keeping pace with inferences

Inferences use logical thought to arrive at a point. Every piece of text progresses in a logical manner and these areas in a passage are fertile ground for questions, especially, inferential questions, which judge the readers' ability to comprehend the reasoning of the author. Some common ways in which an author proceeds to build inferences are – contrast, cause, consequence, purpose and explanation.

Pay attention to the opening paragraph

The manner in which the author introduces the text reveals a lot about the writers' attitude, aim, viewpoint or approach. Writers use different ways to introduce texts. For example, a text can be introduced with the help of analogies, anecdotes, examples, contrasts etc. An analogy is a comparison in which an idea or a thing is compared to another thing that is quite different from it. It aims at explaining that idea or thing by comparing it to something that is familiar. An anecdote is a short account of an amusing or interesting incident which helps enliven the text.

Nature of passages

Usually, the passages can be from any subject area. For example, you can get a passage discussing the launch of a new Indian satellite or a passage detailing some new development in the Indian banking sector and so on.

Keep in mind that the passages will not always be interesting or fun to read; as a matter of fact, some of them will be downright boring and difficult to understand. The language of the passages will be similar to what you are likely to see in publications such as The Hindu or The Economist.

The problem most students face on RC is that they have to go through text from areas they aren't conversant with and answer questions based on this. The moment you see a passage from an unfamiliar area you immediately start telling yourself that you will do badly on this passage because you have no idea about the subject area. If you start with this negative thought process, things will obviously only go downhill for you.

Please keep in mind that you are not expected to have any prior knowledge of the topic in the first place. All the information that you need to answer the questions is given to you in the passage. You just need to comprehend the passage and select the correct answer from the options provided.

Make a passage map

A good way of approaching a passage, especially a long one, is to make a map of the passage. A passage map is nothing but one or two lines for every paragraph in the passage, highlighting why the author has written that paragraph. Note that the passage map does not have to highlight what the author has written but rather why he has written, what he has written, which means that the points in your passage map should always start with verbs such as describe, explain, praise, criticise, condemn, etc. Most of the time you will find this information in either the first or the last sentence of each paragraph.

Identify topic and purpose

Apart from the passage map, there are two more things you need to be absolutely clear about before you look at the first question – The Topic and the Purpose of the passage.

The Topic of the passage is nothing but a word or a phrase that captures the essence of the passage. The topic tells you about the subject matter the entire passage revolves around. You may even get a question asking you to identify the topic of the passage from the given options.

The Purpose is the most important part of the passage and will answer the question – why did the author write the entire passage? When thinking about the purpose, think on three lines – is the author positive i.e. is he trying to praise or support something, is the author negative i.e. is he trying to criticise something, or is the author simply neutral i.e. is he just describing or explaining something. Obviously, this will also clarify the tone of the passage for you. If you are clear about the purpose of the passage, you will not have to keep referring back to the passage to check each option; rather you will be able to eliminate a lot of the options just by looking at them because they contradict the author's primary purpose.



Important Learning: It is very important to keep in mind whether the overall tone of the passage is positive, negative or neutral. Else you will get some easy questions wrong.

Engage with the passage – do not read passively

While reading, try to engage with the passage. This will also help prevent your concentration from wandering. The best way to get yourself involved with the passage is to try to predict what will come next in the passage. When you do this, you are essentially putting yourself in the author's shoes and thinking like him, which will help you get a greater understanding of the passage.

You can use the last sentence of a paragraph to predict what will come in the next paragraph. For example, if the paragraph ends by stating that scientists have proposed a solution for a problem, the next paragraph will most probably provide you with the details of this solution. Once you see that most of your predictions are turning out to be correct, you will find it more fun to read the passage and you'll also notice an increase in your confidence levels as you go about tackling the passage.

Make use of transition words

While making a passage map or generally reading a passage, try to make use of transition words to understand the overall structure of the passage and also to predict what will happen next in the passage. For example, if the author starts a paragraph with the words Similarly or Likewise, then you immediately know that whatever he has described in the earlier paragraph, the same thought process will continue in this paragraph as well.

Contrastingly, if the author is praising something in a paragraph, and the next paragraph starts with the words However or Despite, then you immediately know that the author will now talk about some negative or contrasting aspect of that thing. Transition words will make it very easy for you to understand the broad structure of a passage; these will mostly be found in the first and the last sentence of a paragraph, so pay attention to these sentences.



Important Learning: Always pay extra attention to the first and last sentence of every paragraph as these contain the most important points.

Types of reading comprehension passages

One should pay attention to the organisation of the passage, the structure and logical flow of ideas. Along with this, an understanding of the different types of Reading Comprehension passages—whether they are argumentative, discursive, descriptive or analogous in their construction shall also help a candidate develop effective strategies to approach these passages. Certain key features of the passage structures are:

Argumentative Passages

These passages present the arguments made by the author with respect to a particular subject. In such passages the author presents arguments and counter arguments with the assistance of logic, facts and information. These passages are logic driven in their construction and elucidation. Questions in such passages demand an understanding of the logical structure of the passage and inferences based on the same.

Discursive Passages

In such passages, the author presents his/her ideas and opinions and reinforces the same with the use of logic and data.

Descriptive Passages

Descriptive passages are generally narrative in nature. They include a description of an event/activity/phenomenon. In these passages, techniques of skimming and scanning might be of assistance as the questions will be more factual in nature and can be located easily.

Analogy based Passages

These passages draw comparisons between two unrelated objects or points of reference. These passages demand an in-depth understanding of the analysis and comparisons being drawn. Hence, you are required to analyse the structure and draw inferences.

NMAT by GMAC™ Reading Comprehension

Question Types

Global questions

Global questions are questions that cannot be answered without reading the passage in totality, that is, the answer is not explicitly written in the passage. The main purpose/primary concern type questions will fall under this question type. Here are a couple of examples:

- What is the main purpose of the author in writing the passage?
- What is the primary concern of the third paragraph in the passage?

Note that a passage will never tell you what its main purpose is. However, if you have made a good passage map, then you should not have much difficulty in answering this question. Also, remember that since the answer is not given in the passage, you do not really need to go back to the passage to answer a Global question. This will also save you time.

A trick to answering Global questions in NMAT by GMAC™ is to make use of the fact that each of the options in such questions will start with a verb, which will have a positive, negative or neutral connotation.

Thus, if you are clear on the author's tone, you should be able to eliminate two or three options immediately just by looking at the first word of every option.

For example, if you know that the author's tone is neutral, then options that start with words such as *arguing*, *praising*, *criticising* and so on, will never be correct because these have either a positive or a negative connotation. The correct answer in this case would start with neutral words such as *describe*, *explain*, *analyse* and so on.



Important Learning: The answer to a Global question is never given in the passage, so do not waste your time searching for the answer in the passage.

Detail questions

As the name suggests, Detail questions will ask you questions related to what is explicitly mentioned in the passage. In that sense, they are the opposite of Global questions as the answer to these questions will always be stated in the passage. So, make sure that you go back and read the answer from the passage before selecting an option. This is where a good passage map comes in handy while tackling long passages because you do not have to waste time trying to find the answer in the entire passage. Here are two examples of Detail questions:

- Which of the following is provided by the author as an example of reverse osmosis?
- Each of the following is mentioned in the passage as a side effect of medicine EXCEPT:

Use of EXCEPT on detail questions

Since the answer to a Detail question is always written in the passage, it might seem that these questions would be relatively easier to answer. However, the test maker has a way of making these questions confusing and lengthy by the use of words such as 'EXCEPT'.

For example, a question may state that *According to the passage, each of the following is true of a steam turbine EXCEPT.*

In this case, four of the options will be mentioned in the passage and you will need to identify the fifth option that is not mentioned in the passage. Thus, you need to check each of the options against the information in the passage, which makes the entire exercise take longer than would a regular question.

Also, the wording of the options will be confusing, in the sense that there will not be that one option which contains words that have never been mentioned in the passage (thereby, making it easy for you to identify this as the correct answer). Rather, all the options will contain keywords from the passage; it is just that one of them will convey some incorrect information about the keyword. Thus, make sure that you read every option with a critical eye.

Vocabulary-in-context questions

These questions will ask you to identify the meaning of a word or a phrase as used in the passage. The keyword here is *in context*, that is, the answer always has to be with reference to the passage. The dictionary meaning of the word will rarely be the correct answer; in fact, this is one of the most common wrong answer traps.

To answer these questions correctly, go back and read the sentence which contains this word or phrase. Then, read one or two sentences before and after this sentence to get an idea of the context. Now, look at each option and eliminate. Here are a couple of examples of vocabulary-in-context questions:

- What is the meaning of the word ‘explosion’ as used in the passage?
- The word ‘cynosure’, as used in the passage, is closest in meaning to?



Important Learning: The answer to a vocabulary-in-context question will almost never be the literal or dictionary meaning of the word.

Function questions

Function questions will ask you to identify the function of a word, a sentence, a paragraph, a punctuation mark and so on in the context of the overall passage. These are essentially *Why* questions, that is, they will ask you why the author uses a particular word or sentence in the passage. To answer these questions correctly, you will need to put yourself in the author's shoes and think like the author. Obviously, the understanding of the main purpose of the passage becomes crucial while answering these questions.

Please remember that the question is not asking you for your opinion on something, as this is what students end up providing most of the time. It is asking you for the author's rationale behind writing something in the passage.

Function questions will either start with the interrogative *Why* or they will end with the phrase *in order to*.

Here are a couple of examples of Function questions:

- Why does the author provide the example of the atomic clock in the passage?
- The author provides the example of the atomic clock in the passage in order to.

Inference questions

The dictionary meaning of the term ‘Inference’ is to derive by reasoning, and this is exactly what you will be required to do on Inference questions—arrive at an answer that is not explicitly stated in the passage but that can be definitely concluded given the information in the passage. So, Inference questions will require you to arrive at an answer that can be concluded or stated based on the information provided in the passage. The answer to these questions will never be directly stated in the passage.

Inference is an important question type tested on NMAT by GMAC™ Reading Comprehension, and is also the question type on which students make the most mistakes. This is because students often tend to read too much between the lines, that is, they end up over-inferring from the passage. Hence, make it a point to avoid strongly worded or extreme-sounding options—options containing words such as *must be true*, *always be the case*, *never be the case*, *cannot be determined* and so on—and go with more open ended options—options containing words such as *usually*, *sometimes*, *possibly*, *might be true* and so on. Here are a couple of examples of Inference questions:

- Which of the following is implied by the author in the fourth paragraph?
- Which of the following options would the author of the passage most likely agree with?



Important Learning: While attempting Inference questions, always avoid extreme or strongly worded options.

Tips for attempting Reading Comprehension passages

1. **Keep a track of timelines/statistics** – If you notice that the passage is talking about different time periods, then make sure you keep a track of this chronology as you will almost invariably be questioned on this. Similarly, if you see a lot of statistics or numbers mentioned in the passage, you will most likely be questioned on these.
2. **Don't use outside knowledge, your opinion, or common sense** – All the information you require to answer any RC questions is already given to you in the passage. You should NEVER make use of any outside information while answering questions. Even if you disagree with what the passage states, don't let this cloud your judgment. Approach the passages very objectively.
3. **Read the questions carefully** – After reading the passage, when you start attempting the questions, make sure that you read every question carefully. This is specially the case for TRUE/NOT TRUE type questions in which you can easily mistake one for the other and get your answer totally wrong.
4. **Read all the answer choices** – Even if you like one particular answer choice, make sure you read all the answer choices after it as well because it is possible that there is another answer choice that answers the question even better than the one that you liked initially.

- 5. Try to eliminate some options** – In case you aren't able to arrive at the answer to a question, at least try to narrow down your choices by eliminating some options which you know are definitely incorrect. It's very unlikely that you will be confused amongst 4 or 5 options. Usually, you will easily be able to eliminate 2 or 3 options after which, even if you make a blind guess, you have a 50% chance of selecting the correct answer.

Now let us look at examples from the different areas that contribute the topics for a reading comprehension passage. These passages are accompanied by the different question types and detailed solutions as well.

Subject areas of reading comprehension passages

The reading passages in the NMAT by GMAC™ are drawn from diverse subject areas and genres such as Humanities, Social sciences, Natural sciences, Technology, Economics, Philosophy, Sociology, Literature, Religion and so on. Usually, upon seeing a passage that is outside one's area of study or interest, a candidate either panics or finds it tedious to solve it.

This discomfort with passages is due to several factors- unfamiliarity with the language and subject area, use of technical/subject specific jargon, lack of knowledge and so on. Here it is important to remember that no matter how subject-specific the passage is, the paper setter cannot ask you technical questions. In fact, if the passage is extremely jargon centric, there is a high possibility that the questions from this passage will be relatively easier as the examiner will be forced to ask generic questions that convey the overall ideas of the passage.

Hence, in reading comprehension passages, rather than getting stuck on the language and genre it will be better if you try and identify the underlying ideas and perspectives presented by the author.

Below, we have presented a few sample passages from the key subject areas that are tested on the NMAT by GMAC™. Normally, the passages on NMAT by GMAC™ are from the following broad areas-

1. Humanities
2. Natural Sciences and Technology

3. Social Sciences

Humanities

Passage I

The old civilisation of India was a concrete unity of many-sided developments in art, architecture, literature, religion, morals and science, so far as it was understood in those days. But the most important achievement of Indian thought was philosophy. It was regarded as the goal of all the highest practical and theoretical activities, and it indicated the point of unity amidst all the apparent diversities which the complex growth of culture over a vast area inhabited by different peoples produced.

It is not in the history of foreign invasions, in the rise of independent kingdoms at different times, in the empires of this or that great monarch that the unity of India is to be sought. It is essentially one of spiritual aspirations and obedience to the law of the spirit, which were regarded as superior to everything else, and it has outlived all the political changes through which India passed.

The Greeks, the Huns, the Scythians, the Pathans and the Mughals, who occupied the land and controlled the political machinery, never ruled the minds of the people. These political events were like hurricanes or the changes of season, mere phenomena of a natural or physical order which never affected the spiritual integrity of Hindu culture. If, after a passivity of some centuries, India is again going to become creative, it is mainly on account of this fundamental unity of her progress and civilisation and not for anything that she may borrow from other countries.

1. Each of the following can be inferred from the information in the passage EXCEPT:
 - (A) India has faced various foreign invasions in the past.
 - (B) Philosophy was held in high regard in older civilisations.
 - (C) There has been complacency in Indian philosophical thought.
 - (D) Unity of India was affected due to its vast geographical area.
 - (E) Political invasion has not had any impact on India's spiritual integrity.
2. Which of the following cannot be inferred from the passage?
 - (A) India is a true example of unity in diversity.
 - (B) The integrity of the Indian culture is much stronger than natural or physical forces.
 - (C) India will actively contribute to the progress of mankind.
 - (D) The author predicts that India's progress is due to its political machinery.
 - (E) Indian unity stood strong even in the face of adversities.
3. What is the primary purpose of the author in writing the passage?
 - (A) To compare Indian philosophy with that of other civilisations.

- (B) To analyse the connection between Indian civilisation and philosophy.
- (C) To trace the impact of political invasions on Indian philosophy.
- (D) To discuss the points of unity in India.
- (E) To discuss the rise of spiritual aspirations in India.

4. From the passage, which of the following cannot be concluded about Indian philosophy?

- (A) It has a goal of bringing together different people.
- (B) It brought together practical and theoretical activities.
- (C) It was immune to political upheavals.
- (D) Spirituality is an important part of it.
- (E) It is not subjugated by time.

Solutions

Topic—The Indian culture and its connection with philosophy/spirituality

Scope—Philosophy/spirituality, and not invasions and foreign rules, best describe Indian culture

Passage map

P 1—To state that philosophy was the biggest achievement and also contribution of the Indian civilisation.

P 2—To state that the history of India can be understood best in the spiritual context.

P 3—To further build on P2 by stating that, as it has done in the past, spirituality will define Indian culture and lead to its growth in the future as well.

1. (A) The author has mentioned various invaders like the Huns, Scythians and so on.
- (B) The first paragraph talks of philosophy being regarded as the 'goal of all the highest ... activities'.
- (C) In the last paragraph, the author describes political events as 'hurricanes' and goes on to mention that the 'passivity of some centuries' is temporary and did not have any impact on the underlying spirituality of the country.
- (D) The author has reiterated the underlying unity of Indian spirit through the ages in the passage. He has cited political examples which could have broken the spirit of India, but failed. The author also mentions in the first paragraph: 'it indicated the ... peoples produced'. Hence, (D) is the correct answer.
- (E) This can be inferred from the last paragraph of the passage.

The correct answer is D.

2. (A) Refer to the last line of the first paragraph. The author states that the Indian thought of philosophy is a point of unity amongst the apparent diversities present in India.
- (B) The passage clearly states that the natural and physical changes never affected the 'spiritual integrity of Hindu culture'.
- (C) This is beyond the scope of the passage. The author is discussing India's contribution to philosophy and not to the progress of mankind.
- (D) The author mentions political triumph to illustrate political instability and doesn't suggest that the country's progress is due to the political machinery.
- (E) The second paragraph states that India's unity which is to be seen as spiritual aspirations and obedience to the law of spirit, has outlived all the political changes that India has seen. In the next paragraph, the author clearly states that despite foreign invasions, India's spiritual integrity was not affected.

The correct answer is D.

3. (A) The author never compares Indian philosophy with anything.
- (B) The author has, in the passage, discussed the philosophy of India. He has analysed the underlying factors responsible for its incredible sustainability through the ages,

across political upheavals and geographical boundaries. Hence, (B) is the best answer.

- (C) The political invasions are mentioned by the author to reiterate the sustainability factor of philosophy.
- (D) The unity of India is not under discussion—as per the first paragraph, the author has put philosophy over and above everything else.
- (E) The use of the word ‘rise’ is misleading—the spirituality is assumed in the passage.

The correct answer is B.

4. (A) The author never mentions that the goal of philosophy is to bring together different people. Hence, this cannot be inferred from the passage.
- (B) This can be inferred from the first paragraph.
 - (C) The second paragraph has mentioned categorically that it has ‘outlived’ all political changes.
 - (D) The first paragraph talks about spirituality being an integral part of philosophy.
 - (E) The third paragraph mentions the passivity of the philosophy and also predicts its rise after a ‘few centuries’.

The correct answer is A.

Natural sciences and technology

Passage II

The Cyclopes, according to mythology, were a race of bad-tempered and rather stupid one-eyed giants. Not, perhaps, a great portent for a new generation of robots. But Andrew Davison, a computer scientist at Imperial College, London, thinks one eye is enough for a robot, provided its brain can think fast enough. For a robot to work autonomously, it has to understand its environment. Stereoscopic vision, integrating the images from two 'eyes' looking at the same thing from different angles, is one approach to achieve this, but it involves a lot of complicated computer processing. The preferred method these days, therefore, is Simultaneous Localisation and Mapping (SLAM), which uses sensors such as laser-based range finders that 'see' by bouncing beams of light off their surroundings and timing the return.

Dr. Davison, however, wants to replace the range finders, which are expensive and fiddly, with a digital camera, which is small, cheap and well-understood. With this in mind, he is developing ways to use a single, moving video camera to create continually updated 3D maps that can guide even the most hyperactive of robots on its explorations. His technique involves collecting and integrating images taken from different angles as the camera goes on its travels. The trick is to manage to do this in real time, at frame rates of 100–1,000 per second.

The shape of the world pops out easily from laser data because it represents a direct contour map of the surrounding area. A camera captures this geometry indirectly, and so

needs more (and smarter) computation if it is to generate something good enough for a self-directing robot. The answer is a form of triangulation, tracking features, such as points and edges, from one frame to the next. With enough measurements of the same set of features from different viewpoints, it is possible, if you have a fast enough computer programme, to estimate their positions and thus, by inference, the location of the moving camera.

However, developing such a programme is no mean feat. In the milliseconds between successive frames, relevant information from each fresh image must be extracted and fused with the current map to produce an updated version. The higher the frame rate, the less time there is to do this work.

1. Why does the author use the example of 'Cyclops' in the passage?
 - (A) To reiterate the need for two eyes in order to be successful.
 - (B) To prove that all mythology need not be true.
 - (C) To introduce the concept of one-eyed robots.
 - (D) To predict that the new-generation robots are bound to fail.
 - (E) To prove that SLAM is superior to Stereoscopic vision.
2. From the passage, each of these can be inferred, EXCEPT:
 - (A) Digital cameras are cheaper than range finders.

- (B) Range finders allow robots to see with one eye.
 - (C) The Cyclops is a mythical creature.
 - (D) To work independently, a robot must be able to understand its surroundings.
 - (E) Range finders have the ability to create 3D maps.
3. According to the passage, why is a digital camera preferred over range finders?
- (A) It can collect and integrate images taken from different angles.
 - (B) It is small and economical and well-understood.
 - (C) It is more fiddly.
 - (D) It can continuously update images.
 - (E) It can upload 3D maps.
4. What is the main purpose of the author in writing the passage?
- (A) To explain why SLAM is better than stereoscopic vision.
 - (B) To advocate the use of digital cameras in place of range finders.
 - (C) To analyse emerging techniques in computers.
 - (D) To praise a scientist for his groundbreaking work.

- (E) To discuss techniques for use in self-guided robots.

Solutions

Topic—Robotic vision

Scope—How self-guided robots perceive their surroundings and a possible innovation with regards to the same

Passage map

P 1—To introduce two methods by which a robot can understand its environment—Stereoscopic vision and SLAM—and state that SLAM is the preferred method these days.

P 2 and P 3—To discuss problems with using range finders and how range finders can be replaced by digital cameras.

P 4—To conclude that it will not be easy to replace range finders with video cameras, given the complex nature of computations that need to be done.

1. **(A)** The example is the first sentence of the passage and hence, there is nothing to reiterate.
- (B) The passage doesn't question the authenticity of the mythology.
- (C) The author uses the example of Cyclops to introduce the topic of robots and how even though cyclops were considered stupid, the new-generation robots are being developed with one eye.
- (D) Even though the passage states that Cyclops is not a great portend considering the negative qualities used to describe the creature, the future of the robotics is actually in the use of one-eye. There is no mention of the one eyed-robots failing.
- (E) The passage does suggest that SLAM is better than Stereoscopic vision but the example hasn't been used in that context.

The correct answer is C.

2. (A) This is stated in the first line of the second paragraph.
- (B) The opening lines of the passage talk about Dr. Davison who thinks that one eye is enough for a robot. These robots have so far been using range finders to see with one eye and now Dr. Davison wants to replace these rangefinders with digital cameras. So, rangefinders do allow robots to see with one eye.
- (C) This can be implied from the first line of the passage.
- (D) This can be inferred from these lines in the first paragraph: *For a robot to work autonomously, it has to understand its environment.*
- (E) The second paragraph states that, for digital cameras to replace range finders, it is imperative that digital cameras be able to make 3D maps. But this does not necessarily imply that range finders were also making 3D maps; it is possible that range finders were making use of something entirely different. Hence, (E) should be the answer.

The correct answer is E.

3. (A) This point is relevant not to the digital camera but the computation used by the robots.

- (B) The second paragraph mentions that range finders are expensive and fiddly as opposed to digital cameras which are small and cheap, because of which Dr. Davison prefers the latter. Refer the lines, "*Dr. Davison, however, wants to replace the range finders, which are expensive and fiddly, with a digital camera, which is small, cheap and well-understood.*"
- (C) It is range finders that are fiddly, not the digital cameras.
- (D) This point is relevant not to the digital camera but the computation used by the robots.
- (E) This point is relevant not to the digital camera but the computation used by the robots.

The correct answer is B.

4. (A) This is just a part of the passage, but the passage is doing much more than just this.
- (B) It is Dr. Davison who is advocating this fact; the author of the passage is neutral in his tone.
- (C) The passage is only about robots and not computers in general.
- (D) The author does not praise anyone in the passage.
- (E) The whole passage talks about computer programmes that will help in the development of self-guided robots. Option (E) provides an apt summary that lucidly indicates the essence of the passage.

The correct answer is E.

Social science

Passage III

There is no doubt that Machiavelli's *The Prince* was very different from other political texts of the Classical era in that it veered more towards the shrewd and pragmatic modern form of politics. However, there is sufficient proof that Machiavelli was not the creator of this political system. In fact this system, called 'realpolitik' or politics without principles, was actually in practice long before Machiavelli's time. Machiavelli just made this system more popular and mainstream.

One example of the use of realpolitik before Machiavelli's time is of the evil Spanish imperial advisor Ortega Sorolla, who openly stated that the ruling emperor was to be supported at all costs and who imprisoned or executed anyone who posed a challenge to the emperor. In fact, several historians believe that Sorolla actually got several exceptionally talented men secretly assassinated as he was afraid that one day they would pose a threat to the emperor's throne.

Supporters of Machiavelli believe that power was a tangible entity, which could be reflected or ascertained by the size of the army that a ruler commanded. The ruler's objective was to instill in the minds of his followers the fact that they should always think about war and how they would be victorious in one, as neglecting this could often lead to losing one's kingdom. For Machiavelli, the truly powerful kingdoms were those that could use their money and clout to command large armies and use these armies to subjugate other kingdoms. These conquered kingdoms then deservedly became objects of ridicule and contempt.

Machiavelli's lack of focus on the quality of governance within a state is clear from the fact that it is only as late as in chapter XII that he talks about the importance of having good laws within a state. This too seems to be an afterthought since Machiavelli pays no particular attention to the quality of these laws. He simply makes open ended statements and never really goes down to describing in details what attributes make up a 'good' law.

According to Machiavelli, whatever actions a prince undertakes are with the single minded intention of gaining a good reputation in history books, even if that reputation is earned after the death of the prince. Machiavelli narrates the example of Agathocles, who rose from poverty to become the king of Syracuse by killing all those who stood in his path. This made Agathocles truly powerful in Machiavelli's eyes. However, Machiavelli still doesn't consider Agathocles' achievements as perfect because, by committing the atrocities that he did commit, Agathocles only gained power but no glory. Thus, he failed to become part of the clique of famous men who had earned glory in Machiavelli's eyes.

1. Which of the following can be inferred from the passage about most political theory in the Classical era?
 - (A) It was not favoured by several important men of that time.
 - (B) It was considered mild and less aggressive in comparison to other political theories of that time.
 - (C) It was rooted more in practicality than in principles.

- (D) It was eventually abandoned in favour of realpolitik countries.
 - (E) At least some of its tenets were not rooted in practicality.
2. Why does the author mention *Chapter XII* in the passage?
- (A) To explain that Machiavelli never actually described what were the characteristics of a good law.
 - (B) To show that Machiavelli considered arms superior to laws.
 - (C) To highlight the low level of importance Machiavelli assigned to the presence of good laws in a state.
 - (D) To prove that good governance never formed a part of Machiavelli's teachings.
 - (E) To explain how Machiavelli was only concerned with the presence of laws, not with their quality.
3. What is the meaning of the term 'clique' as used in the last sentence of the passage?
- (A) Group
 - (B) Status
 - (C) Mob
 - (D) Faction
 - (E) Crew

4. Which of the following is a point of similarity between Sorolla and Machiavelli?
- (A) Both of them believed in the supreme position of the emperor.
 - (B) Both of them believed that victory in a war was paramount, no matter at what cost it came.
 - (C) Both of them believed that maintaining a strong and able army was more important than making good laws.
 - (D) Both of them believed that it was acceptable to go to any lengths in the single minded pursuit of one's goal.
 - (E) Both of them were a creation of the initial monopoly of the Classical political theory.

Solutions

Topic—Realpolitik

Scope—To explore Machiavelli's concept of politics without principles

Passage map

P 1—Introduces the term ‘realpolitik’—politics without principles.

P 2—Provides an example of how Machiavellian principles have been practiced from even before his time.

P 3—Provides Machiavelli’s description of a strong person.

P 4—States that Machiavellian wasn’t particularly bothered about good governance.

P 5—Provides Machiavelli’s distinction between power and glory.

1. **(A)** This has not been stated anywhere in the passage.
- (B) This has not been stated anywhere in the passage.
- (C) As per the passage, this is true of realpolitik and not of Classical theory.
- (D) There’s nothing in the passage to suggest that the Classical theory was eventually abandoned.
- (E) The opening sentence of the passage states that realpolitik was more shrewd and pragmatic (practical) than the Classical political theory. Thus, it can be concluded that at least some of the tenets of the Classical theory were not rooted in practicality.

The correct answer is E.

2. (A) This is an incorrect inference.
(B) This is an incorrect inference.
(C) Since the passage mentions *Chapter XII* to highlight the fact that it took Machiavelli XI chapters to talk about arms and army before he mentioned good laws for the first time, it shows how unimportant good laws were in Machiavelli's scheme of things.
(D) This is opposite of what the passage says.
(E) This is an incorrect inference.

The correct answer is C.

3. 'Clique' means a narrow exclusive circle or group of persons
- (A) 'Group' refers to a number of people or things sharing a similar characteristic or feature. This is the closest in meaning to the given word, 'clique'.
(B) 'Status' refers to a position or rank in relation to others.
(C) 'Mob' means a large and disorderly group of people. Even though 'mob' is a synonym of clique, it is not used in the passage in this context.
(D) 'Faction' refers to a small organised dissenting group within a larger one. The passage doesn't refer to an organised dissenting group but just an exclusive group which is different than the rest.
(E) 'Crew' refers to a group working together.

The correct answer is A.

4. (A) Sorolla believed in maintaining the absolute supremacy of the king whereas Machiavelli believed that wars needed to be won at any cost. This option can be eliminated.
- (B) Only Machiavelli believed in this philosophy. This option can be eliminated.
- (C) Sorolla believed in maintaining the absolute supremacy of the king whereas Machiavelli believed that wars needed to be won at any cost. This option can be eliminated.
- (D) This is the correct answer because both Sorolla and Machiavelli believed in going to any lengths to maintain the supremacy of the king and win wars respectively.
- (E) It is not mentioned or implied anywhere in the passage.

The correct answer is D.

4.5 Para Forming

4.6 What is Measured?

Para forming questions are not necessarily a test of your language skills. Questions on para forming are designed to assess your reasoning rather than reading comprehension.

You will be tested on your ability to build logical connections and comprehend jumbled text.

4.7 Overall Test Taking Strategies

1. While attempting para forming questions, try to create a link between two options and eliminate wrong answer choices.
2. Do not read the sentences in all the combinations available. This will only create confusion and doubt.
3. Use mandatory pairs to solve these questions.

Introduction

Para forming involves working with jumbled paragraphs. Basically, you are given a paragraph - but the sentences are not in the right order. It is now up to you to rearrange these sentences to form a coherent, logical paragraph.

This type of question is quite common in management entrance tests. Para forming questions are not necessarily a test of your language skills. In para forming, we are essentially given some statements which have to be put in a coherent sequence. Hence, fundamentally, we are trying to solve a verbal puzzle using clues in the form of mandatory pairs.

This means that even if you are not conversant with the idea being discussed or familiar with the topic on which the paragraph is based, you can still easily resolve it with high accuracy levels.

Para forming concepts

Here are a few things NOT to be done while attempting these questions –

1. Reading the sentences and trying to resolve the para on the basis of the flow of ideas. While this approach makes sense intuitively, the paragraph might be a tricky one wherein the flow of ideas might not be easily discernible. Most people lose focus by reading the statements given over and over again. Sometimes, it is next to impossible to make out which sentence follows which one.
2. Not attempting a para forming question because the topic on which the paragraph is based is from a genre that you are not conversant with.
3. Reading the sentences in the order of all the combinations provided. Generally, every question has four options – each option suggests a different sequence for resolving the paragraph. While it is tempting to read the sentences in all the possible combinations, doing this will not only confuse you but, after some time, every combination will start appearing correct! Also, solving all options will waste your time tremendously.

The best way to form a para is to try and identify Mandatory Pairs. A mandatory pair is a sequence that you know cannot exist in any other order. In other words, 2 or more statements that have to be grouped together, if we are following the rules of the language, constitute a mandatory pair.

There are many ways of identifying mandatory pairs. But there is only one basic approach to identify them - look at para forming questions like a detective and search for clues

that the thief or in this case, the papersetter has left for you (Keywords). Then, just like a detective, use these clues to form a sequence or connection and complete the chain!

Identification of mandatory pairs

Names, Proper Nouns, Pronouns

Look at the statements given below:

- A.** Mr. Smith checked the quality of food and asked flood victims about the help from the government.
- B.** He also instructed officials to focus more on the quality of food, and sanitation for women, at the camps.
- C.** The Minister for Water Resources James Smith and other officials inspected several relief camps in the flood hit district.

What, according to you, should be the sequence of the statements given? Obviously, the answer is CAB. Let us understand why. Statement C contains the full name of the person – James Smith. Statement A contains the surname – Mr. Smith, while statement B introduces the personal pronoun – he. Thus, the correct sequence is CAB.

Sometimes, we can identify mandatory pairs or a longer sequence with the help of the names, proper nouns and pronouns used. Also, keep in mind that English demands the presence of an antecedent for a pronoun, that is, if a pronoun has been used; it needs to refer to a noun or another pronoun. Identifying the antecedent can also help identify the mandatory pair.

The use of personal pronouns (I, me, you, us, he, they, it etc...) and demonstrative pronouns (this, that, these, those) is extremely helpful in resolving para forming questions.

Cause and effect

There are instances where a cause and effect relationship can be identified. Such a relationship may exist in the form of a mandatory pair or run through the paragraph. There are some cause-effect indicators (refer the table). The presence of any of these words acts as a clue to identify a cause and its effect, which shall help us form a mandatory pair.

Showing cause	For, As a result of..., Because ..., Due to (the fact that), In order to ..., Resulting from ..., Since...
Showing effect	So, Accordingly, As a result, Consequently, Hence, Therefore, Thus, (If) ... then, ... resulting in, So ..., that..., then
Showing condition	Even if, If ... then, In case, Provided that, Providing, Unless, Whether or not

Example 1

Look at the statements given below:

- a.** Otherwise the opposition party would not have opposed FDI in retail today.
- b.** It is evident that there is no agreement on economic reform
- c.** Nor would allies of ruling party oppose disinvestment.
- d.** All this will have a detrimental impact on India's journey towards becoming a world leader.

- (A) abcd
- (B) abdc
- (C) bacd
- (D) bcad
- (E) dabc

In the above set of statements, it can easily be ascertained that statement a is describing the consequence of something, the cause of which has been explained in statement b. Thus, ba becomes a mandatory pair. Hence, option C becomes the correct answer.

Chronology

At times you can see a logical chain of events in the paragraph. It could also be in the form of a set of instructions to be followed in a certain order. If you look for keywords associated with the sequence, you can easily figure out the right order.

Also, some questions have a statement that refers to a point in time. The reference may be in the past, present or future. Accordingly, you can decide its place in the sequence. In such situations – the past will always come first, followed by the present and then the future.

Example 2

- a.** An ishango bone was found in the Congo with two identical markings of sixty scratches each and equally numbered groups on the back.
 - b.** Presently, the earliest known archaeological evidence of any form of writing or counting are scratch marks on a bone from 150,000 years ago.
 - c.** These markings are a certain indication of counting and they mark a defining moment in western civilisation.
 - d.** But the first really solid evidence of counting, in the form of the number one, is from a mere twenty-thousand years ago.
- (A) dcba
 - (B) bdac
 - (C) bacd
 - (D) abcd
 - (E) dabc

In the above set of statements, statement b opens the paragraph by stating what is available with us at present, while statement d sets the chronology by giving indication of the first piece of data made available. Thus, bd becomes a mandatory pair making option B the right answer.

Transition words

Transition words indicate a shift in ideas. They ensure the logical organisation and connection of sentences. These may be of two types –

Extending words (*also, again, as well as, furthermore, in addition, likewise, moreover, similarly, consequently, hence, subsequently, therefore, thus...*)

Contrasting words (*yet, but, however, still, nevertheless...*)

These words provide clues with respect to the sequence of sentences (sentences that shall precede or follow a particular sentence.). A list is provided for your benefit (please note that the words provided herein are not exhaustive, merely indicative)

Showing time (Beginning, During, Ending)	And, Before, As, As long as, At the same time (as), Every time, Since, So long as, The first/second/next/last time, When, Whenever, While, By the time, Till, Until, Afterward(s), At first, Initially, Meanwhile, Meantime, Simultaneously, Eventually, Finally....
Showing a sequence	And, After, As soon as, Ever, since, Following, Later, Once, Next, Subsequently, Then, Thereafter, First, Firstly, Initially, To begin, Next, Then, Finally, Last, Lastly
Showing	So, In all, In summation, In

conclusion	conclusion, To conclude
Showing contrast	But, Either ... or, Yet, Although, Despite, Even though, In spite of, Instead of, Though, Whereas, While, By comparison, By contrast, Conversely, However, In contrast, Instead, Nevertheless, Nonetheless,, On the contrary, On the other hand, Otherwise
Showing similarity	Neither ... nor, Either ... or, In other words, Likewise, Similarly
Adding information	And, Additionally, Also, Besides, Further, Furthermore, In addition, Moreover
Adding example	For example, For instance, In particular

Example 3

- a.** Hence, more and more administrators are becoming aware of the critical need to keep parents apprised of the newer methods used in schools.
- b.** Therefore, the great influence of parents cannot be ignored or discounted by the teacher.
- c.** However important we may regard school life to be, there is no gain saying the fact that children spend more time at home than in the classroom.
- d.** They can become strong allies of the school personnel or they can consciously or unconsciously hinder and thwart curricular objects.

(A) badc

(B) cdba

(C) cbda

(D) cdab

(E) dabc

In the above mentioned para forming question, we can identify two transition words – Hence and Therefore. Both these keywords are used to explain the consequence of something. Upon perusal of the text, it is apparent that statement b is the explanation for statement c while statement a concludes the passage, Thus, cb become a mandatory pair making option C the correct response.

General to specific

In case one is stuck between two statements that appear to form a mandatory pair but one can't decide the sequence of the statements, that is, which one should come first, we follow the principle of *general to specific*. Let us elucidate the concept with an example:

Example 4

- a. He made an interesting comment about our store's pricing policy.
 - b. He said that we could offer discounts and incentives to encourage people to buy in lesser quantities but more frequently.
 - c. Discounts could be given ranging from 15–20 percent on every purchase made.
 - d. The lesser the quantity, the more frequently the customers will have to visit the store. The more frequent the visits, the more incentives they can earn.
- (A) abcd
 - (B) abdc
 - (C) bdca
 - (D) badc
 - (E) dabc

In the paragraph given above, there can be some confusion between bcd and bdc. In such a scenario, we follow the general to specific rule. Statement c is a specific example of the proposal outlined in statement d. Hence the correct sequence is abdc, making answer option B the correct response.

Some other ways in which mandatory pairs can be identified are through the use of –

1. **Obvious Openers:** You may sometimes come across statements that are obvious openers, that is, it is clear that the paragraph begins with them. They could either

be introducing the idea or contain all the relevant terms/definitions. These statements can be definitions, universal truths or philosophical statements.

2. **Obvious Conclusions:** Sometimes, you can easily figure out the concluding line of the paragraph. Keywords might also be available to help narrow your choices.
3. **Use of Acronyms:** If both the full form as well as the short form of a term is present in different sentences, then the sentence containing full form will come before the sentence containing short form.
4. **Definition and Example:** If any sentence is working as an example, place it after the sentence it is explaining. It might not necessarily form a mandatory pair but the example has to follow the idea/hypothesis/theory it is elucidating.
5. **Use of Articles:** By their very definition, when the author uses 'a / an' - he wants to make a general statement but when he uses 'the', he wants to refer back to some previously discussed noun. Hence, the use of 'the' is quite unlikely in the opening sentence. Also, if both 'a/an' and 'the' are used for the same noun then the sentence containing 'the' will come after the sentence containing a/an.

Logical sequencing of paragraph

While attempting questions on para forming, the key is to ensure that there is a logical flow in the sentences of the paragraph. In order to ascertain the logical flow of sentences, the following steps should be adopted:

1. Read the question and the answer choices
2. Examine the answer choices
3. Eliminate incorrect choices
4. Review the flow of events

Read through the paragraph and break down each sentence in your own words. Sometimes, you can eliminate a few sequences by just going through the answer choices. Use the various rules described above to identify the grouping of the sentences. Once you pick your answer, make sure you read through the given paragraph in the selected sequence. This will ensure your answer fits into the flow. It will also help you check whether you have chosen the correct answer. You will then be able to tell right away, if something is missing or feels wrong.

Let us now consider the different types of questions that are asked with respect to para forming.

Short question type (4 sentences)

In this, a paragraph is broken into four parts which are then jumbled together. You are required to rearrange these sentences in a logical order to form a coherent paragraph. Let us understand this with the help of an example:

Example 5

Directions: Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

- a. The app was initially designed for transferring money over the mobile since carrying cash was risky.
- b. One of the major telecom operators brought the application to India and launched it as a pilot in one of the states, rolling it out fully in 2013.
- c. But it soon changed into a financial service and became a big hit.
- d. A mobile based application, started in Kenya in 2007 as a CSR pilot project by a subsidiary of the telecom operator.

- (A) bcda
- (B) dacb
- (C) dcab
- (D) bcda
- (E) dbca

Solution

Sentences da form a logical pair since the 'the app' in sentence (a) refers to 'application' in sentence (d). Also the entire paragraph is about a mobile application, so it should start with sentence (d). Thus, option (B) is the correct answer.

The correct answer is B.

Long question type (5 sentences)

The basic structure of the question remains the same. The only difference is that here the paragraph is broken into five parts which are then jumbled together. You are required to rearrange these sentences in a logical order to form a coherent paragraph. Let us understand this with the help of an example:

Example 6

Directions: Choose the most logical order of sentences from among the given choices to construct a coherent paragraph

- a. Former Prime Minister of India, Atal Bihari Vajpayee too was a fan of mangoes and his childhood friend Anna Kiwalkar would send him two crates every week during the season.
- b. The exchange is termed as ‘mango diplomacy’ and is seen as winning over foes.
- c. Former Prime Minister of India, Indira Gandhi’s love for mangoes was well known within her circle and close friends visiting her would always get mangoes for her.
- d. This exchange is based on the intense national pride across South Asia about whose mangoes are the most delicious.
- e. Prime Ministers of India and Pakistan frequently send the best varieties of mangoes from their respective countries to each other.

(A) caedb

(B) bdeac

(C) deacb

(D) baedc

(E) cdeab

Solution

This exchange and *the exchange* are the clues to the right sequence—edb. Also sentence (a) has to come immediately after sentence (c) because of the use of *too* in sentence (a).

The correct answer is A.

4.8 Error Identification

4.9 What is Measured?

This section will test your ability to apply common grammar rules such as agreement of the subject with the verb and with the pronoun, tenses, modifiers, parallel construction and so on to identify the errors in a sentence.

You will also be tested on the correct usage of idiomatic expressions such as *forbid to* (and not *from*), *between.....and* (not *or*), etc.

4.10 Overall Test Taking Strategies

1. Read the entire sentence carefully and make sure you have understood its meaning.
2. Avoid using the ear (or what *sounds* correct) to answer questions. Try to apply the grammar rules instead.
3. Always narrow down to two choices and read both the choices back into the original sentence before selecting your final answer.

Introduction

Grammar is tested on the NMAT by GMAC™ primarily through two question types:

1. Error Identification
2. Choose the correct prepositions

However, it would be wrong to assume that the assessment or application of grammar is limited to these questions only. Grammar permeates the very fabric of the language so any test which assesses your English language skills ultimately tests your English grammar skills as well. Indeed, it is no exaggeration that grammar skills are second in importance only to reading skills as far as aptitude tests are concerned.

However, this book is not an in-depth guide to grammar—for two reasons. Firstly, learning the grammar of a language to an advanced level is too vast an undertaking. Secondly, knowing a lot of grammar rules in minute detail may confuse you more than it will help.

For the purpose of this book, we assume that you already have a working knowledge of English grammar, in that you can read, write, speak and understand it moderately well. We will also assume that you are familiar with basic terms of grammar, such as nouns, verbs, phrases, clauses, subject, object, etc. (A basic definition is given for each in the next section). But, what we will essentially focus on are the finer points of grammar, which are explicitly tested in aptitude tests such as the NMAT by GMAC™.

Error identification

Questions based on error identification ask you to identify the error in a sentence out of four underlined sections. For scoring well on this question type, it is important to become conversant with the key rules and major grammatical errors that most questions are based on. By doing this, the time taken to solve the grammar questions will decrease and the accuracy will also improve. Questions based on error identification assess a candidate's knowledge and application with respect to the following key aspects-

1. Idiomatic usage
2. Modifiers
3. Pronouns
4. Parallelism
5. Agreement
6. Articles
7. Comparison
8. Tense

However, to identify these errors correctly or even to ascertain that a particular sentence is error free, one needs to have an understanding of the fundamentals of English grammar and their application. The next few pages review these concepts in brief and analyse the different elements that can contribute to the error identification questions.

Let us begin by understanding the Parts of Speech:

Part of Speech	Definition	Sentence Usage

Part of Speech	Definition	Sentence Usage
Verb	Expresses action or state	Wow! Seema and her talented sister have participated successfully in several competitions.
Noun	Name of a person, place, thing or even idea	Wow! Seema and her talented sister have participated successfully in several competitions .
Adjective	Describes a noun	Wow! Seema and her talented sister have participated successfully in several competitions.
Adverb	Describes a verb, adjective or adverb	Wow! Seema and her talented sister have participated successfully in several competitions.

Part of Speech	Definition	Sentence Usage
Pronoun	Substitutes a noun	Wow! Seema and her talented sister have participated successfully in several competitions.
Preposition	Links a noun or pronoun to another part of a sentence.	Wow! Seema and her talented sister have participated successfully in several competitions.
Conjunction	Connects clauses or sentences or words	Wow! Seema and her talented sister have participated successfully in several competitions.
Interjection	A short exclamation which expresses emotion.	Wow! Seema and her talented sister have participated successfully in several competitions.

Countable and uncountable nouns

Nouns are 'naming words'- words that are used to name persons, things, animals, places, ideas, or events are nouns. There are different types of nouns but more often than not, the errors come from countable and uncountable nouns.

Countable – Countable nouns refer to anything that can be assigned a count, and has a singular and plural form. Examples: Bottle, Computer, Shirt

Mass (Non-countable) –Non-countable nouns are those nouns that can't be counted as it is not possible to break them into separate elements. They need determiners and quantifiers in order to be put in units and counted. Examples: Milk, Oil, Sand, Oxygen

Please note: Uncountable nouns are always in singular number. They don't have any plural form!

Note: All these nouns are uncountable as per the English language: accommodation, advice, behavior, information, news, progress, traffic, travel, trouble, weather, work, tea, water, air, knowledge, beauty, anger, fear, love, money, research, safety, evidence. Also, there are certain nouns that, though countable by definition, are always treated as uncountable in the English language. These include: baggage, bread, furniture, luggage, sugar, rice and so on.

The noun 'hair' is considered uncountable in English; hence it does not have a plural version. It can be countable only when referring to individual hairs. Consider the examples given below:

She has long blond hair.

I washed my hair yesterday.

My father is getting a few grey hairs now. (Refers to individual stands of hair)

I found a hair in my soup! (Refers to a single strand of hair)

Note: There are certain non-count nouns that convey a different meaning when used in the plural form. Let us consider a few examples:

Water – The non-count ‘water’ is used to indicate any quantity of water, whether a small amount (get me a glass of water) or large amount (the water is too cold)

Waters – The plural ‘waters’, on the other hand, is used especially for an area of seawater, and tends to appear in more formal contexts (“shipping lanes in international waters”) and in literary contexts (“the azure skies and clear waters of the Pacific”).

Wood – Wood is (uncountable) the substance making up the central part of the trunk and branches of a tree used as a material for construction, to manufacture various items, and so on or as fuel.

Woods – Woods is (uncountable) a dense collection of trees covering a relatively small area; smaller than a forest.

Certain other words that convey different meanings in their singular and plural form are: work-works, paper-papers, money-monies, good- goods, and so on.

Examples of Quantifiers		
With	With Countable	With Both

Uncountable Nouns	Nouns	
much	many	all
a little/little/very little	a few/few/very few	enough
a bit (of)	a number (of)	more/most
a great deal of	several	less/least
a large amount of	a large number of	no/none
a large quantity of	a great number of	not any
	a majority of	some
		any
		a lot of
		lots of
		plenty of

Many is used before plural countable nouns while much is used before uncountable nouns:

*Anuj didn't have **much** experience.*

*On the way she made **many** mistakes.*

***Much** time was wasted on unproductive tasks. (Considerable amount of time)*

Before countable nouns, we use “few” and before uncountable nouns, we use “less” or “little”.

Few and A few have different meanings: Few is equivalent to “something negligible” or “hardly any” while, a few is equivalent to “some”. Example:

Few persons can keep a promise.

A few persons are convinced about the new boss.

Same is the case with ‘little’ and ‘a little’.

Collective Nouns – Collective nouns refer to a collection of persons or things that is considered as a whole. Example: class, pride, fleet, pack, deck, flock.

Cases of Nouns/Pronouns

Nominative Case	Accusative Case	Genitive Case
Also called the subjective case.	Also called the objective case.	Also called the possessive case.
It refers to the subject of the verb.	It is called the objective case because it refers to the direct object of a verb. On the other hand, the 'dative case' refers to the indirect object of the verb.	It refers to the possession of another noun.
A noun or pronoun is in the subjective case when it is used as the subject of the sentence.	A noun or pronoun is in the objective case when it is used as a direct object, an indirect object, or an object of the preposition.	A noun or pronoun is in the possessive case when it is used to show ownership of an object.
Examples: Nancy participated in the state	Examples: Neha gave me money. The teacher gave	Examples: Where did you find my books? This pen is mine.

championship. I love dancing.	the notes to the student.	

Pronouns

A pronoun is a word that replaces a noun or a group of words used as a noun. It acts as a substitute for a noun.

Pronouns are classified into various categories. The more important of these are –

1. Personal Pronouns
2. Relative Pronouns
3. Demonstrative Pronouns
4. Reflexive/Intensive/Emphatic Pronouns
5. Indefinite Pronouns
6. Reciprocal Pronouns
7. Possessive Pronouns
8. Interrogative Pronouns

In the following portion we shall focus on the more commonly confused usage of personal pronouns.

Personal pronouns

Personal pronouns refer to the speaker or speakers. They take the place of proper nouns (the names of people, places or things) and are used to avoid repetition

They can be spoken in the *First, Second or Third person*.

First Person – The subject of the sentence is *the person speaking*.

- I am so tired today!
- We are going to the mall.

Second Person – The subject of the sentence is *the person or people being spoken to*.

- You seem very excited about your trip.
- You should have waited for the professor.

Third Person – The subject of the sentence is *the person, people, or things being spoken about*.

- He is going to see a film this afternoon.
- They will have to resolve the issues at the earliest.

Types of Personal Pronouns – There are three common types of personal pronouns:

- Subject pronouns,
- Object pronouns, and
- Possessive pronouns.

Subject Pronouns – Subject pronouns (I, You, He, She, It, They, We) are used in place of the subject in the sentence.

Example: Richa and Riya study in Xth grade. They are twins. “Richa and Riya” are the subject and “they” is the subject pronoun.

Object Pronouns – Object pronouns (Me, You, Him, Her, It, Us, Them) are used in place of the object in the sentence (the noun that receives the action in a sentence). Example: After Rayman bought a phone, it got broken within a week, “it” is the object pronoun used to replace “phone.”

Possessive Pronouns – Possessive pronouns are used in the place of a noun phrase to indicate ownership (My, Our, Your, Her, His, Its, Their, Mine, Yours, Ours). They show who or what owns something. For example -

- *My* apartment is big.
- *Your* dinner is ready.
- *His* favorite subject at school is English.
- This book is *mine*.
- The puppy dumped *its* water bowl.

Note the difference between possessive adjectives and possessive pronouns:

Possessive Adjectives	Absolute Possessive Pronouns
• my • your • his • her	• mine • yours • his • hers

• its • our • their • whose	• ours • theirs

Let us take a few examples –

- Take Karan's bike to the house.
- Take *his* bike to the house. - In this example, the possessive adjective 'his' replaces 'Karan'
- Take *his* to the house. - In this example, the absolute possessive pronoun 'his' replaces 'Karan's bike.'
- Anyone who listens to rock music ought to have *his* brain examined. - This is a possessive adjective.
- If we are work hard and are determined, victory shall definitely be *ours*. - This is an absolute possessive pronoun.

In the following sentence, identify the possessive adjective and the possessive pronoun -

Some envy *my* success, while some fear it; but it is *mine*, a manifestation of dreams that are *ours*, soaring above *their* fear and jealousy.

Solution

In the sentence provided above, my and their are possessive adjectives, while mine and ours are absolute possessive pronoun.

The words *hers, ours, theirs, and yours* are sometimes termed 'absolute' or 'independent' as unlike other pronouns they don't require an antecedent. They can be used independently to show possession. Kindly note that no apostrophe is required for these pronouns.

It's is the abbreviation of "it is". For example- "It's (= it is) raining cats and dogs". However, Its is the possessive form of "it" and shows ownership. For example: "Sanjeev has a beautiful watch. I can't remember its brand though".

Impersonal pronouns

Pronouns which substitute nouns that refer to inanimate objects or are in the neuter gender are called Impersonal pronouns.

Kindly refer the following table in case of any doubts –

		First Person	Second Person	Third Person	Impersonal
Subjective	Singular	I	You	She, He	It
	Plural	We	You	They	They
Objective	Singular	Me	You	Her, him	It
	Plural	Us	You	Them	Them
Possessive Subjective	Singular	My	Your	Her, His	Its
	Plural	Our	Your	Their	Theirs
Possessive Objective	Singular	Mine	Yours	Hers, His	Its
	Plural	Ours	Your	Theirs	Theirs

I/we/you/he/she/it/they are pronouns that represent the subject in a sentence while **me/us/you/him/her/it/them** are pronouns that represent the object.

*I gave the packet to **him**.*

***She** gave a rose to **me**.*

***We** are faster than **they** are fast, gets shortened to:*

***We** are faster than **they**.*

***We** are faster than **them**. (Incorrect)*

Use of I v/s Me

Both *I* and *me* are 1st person singular pronouns, which means that they are used by one person to refer to himself or herself.

I is the subject pronoun, and is used for the person “doing” the verb. Consider the following examples:

I am waiting for my friends (I is the subject for *am waiting*)

I don't think he is as willing to consider a new idea. (I is the subject for *think*)

Me is the object pronoun, used as the object (or receiver) of the action of the verb, as in these examples:

My father took me to the doctor. (Me is the object of *took*)

She motivated me to participate in the competition. (Me is the object of *motivated*)

Note: If you are having trouble deciding the pronoun to be used try completing the sentence. That should help you decide the right pronoun.

Use of Who, Which, and That

Who, which and that are relative pronouns (that is, they are used to refer back to a person or thing previously mentioned). While we use 'who' to refer to people; 'which' and 'that' are used largely to refer to things.

However, when introducing a restrictive relative clause, we use 'that' or 'who' or 'which' without a comma.

Consider the following examples:

My car that is big consumes a lot of petrol ('That' is used for the purpose of identification and definition. In this sentence, 'that is big' defines the 'car' being referred to. It indicates the presence of more than one car and restricts the information being provided to a particular car.)

My car, which is big, consumes a lot of petrol (in this sentence, 'which' is introducing additional information that does not impact the sentence as a whole; I can simply say – "my car consumes a lot of petrol")

We don't use 'that' to introduce a non- restrictive additional clause –

My bag, that is blue, is quite old (Incorrect)

My bag, which is blue, is quite old (Correct)

After two antecedents, one of which is the name of a person and the other, the name of some animal or thing, use 'that' in place of 'who' or 'which'.

The lady and her pet dog that came yesterday have come again today.

After words such as all, any, none, only, alone, nothing, use 'that' in place of 'which' or 'who'.

Man is the only animal that can think.

All that glitters is not gold.

In case of any doubts, refer to the following table:

Relative pronoun	Relative clause referring to person or people	Relative clause referring to things	Restrictive relative clause	Non-restrictive relative clause
that	√	√	√	X
which	X [used in traditional texts]	√	√	√
who	√	X	√	√

Use of Who and Whom

The pronoun 'who' is used in place of a noun/pronoun in the nominative case while the pronoun 'whom' is used in place of a noun/pronoun in the accusative case.

In case of any doubts, follow this simple rule; if you can replace the word with 'he' or 'she'; use 'who'. However, if you find yourself using 'her' or 'him' to replace the word, then use 'whom'. The same principle applies to the use of 'whoever' and 'whomever'.

Consider the following sentences:

Fakir is the man (who/whom) has been chosen (The correct answer is 'who'; as 'he' is the man who has been chosen)

Fakir is the man (who/whom) we have chosen (The correct pronoun is 'whom' as 'We- subject' have chosen 'him')

Use of Each other and One another

Each other refers to two items while *one another* refers to more than two items.

At the campus I came across my colleague and we complimented each other.

The guests at the party knew one another.

(The sentence implies that each guest knew the rest.)

The scientists at the conference were exchanging ideas with each other.

(This sentence implies that the exchange was happening between two scientists at a time)

The table given below illustrates the various kinds of pronouns with an example of each kind. Fill up the table with a few more examples:

Type	Pronouns	Example
Possessive	Mine, yours, his, her, ours, theirs	This dress is mine.
Reflexive	Myself, yourself, himself, herself, itself, oneself, ourselves, yourselves, themselves	He cooked the lunch himself.
Reciprocal	Each other, One another	They really like each other.

Relative	That, which, who, whose, whom, where, when	The bike that broke down has now been repaired.
Demonstrative	This, that, these, those	That book is a bestseller.
Indefinite	Anything, anybody, anyone, something, somebody, some, nothing, nobody, none, no one	None was present for the Session.
Interrogative	Who, what, why, where, when, whatever	Who is at the door?

Using the correct Adverb

Adverbs are words that are used to modify or describe verbs. They typically end with an 'ly' construction. For example, in the sentence 'Jackie runs quickly' the adverb *quickly* describes or modifies the verb *runs*. However, adverbs can also modify adjectives and even other adverbs.

*This is a **seemingly** difficult question* (the adverb *seemingly* modifies the adjective *difficult*)

*Kumud eats **very** slowly* (the adverb *very* modifies the adverb *slowly*, which in turn modifies the verb *eats*)

Here is a list of some important adverbs from the exam perspective:

1. **Since** – *Since* is used to denote when an activity started. For example, I have been waiting here *since* yesterday.
2. **Too** – *Too* is used before adjectives. The use of *too much* before adjectives is wrong.

You are *too much* nice to him. INCORRECT

You are *too* nice to him. CORRECT

3. **Enough** – When *enough* is used to modify adjectives or adverbs, it is always put after the adjective or adverb.

Is the house *enough* large? INCORRECT

Is the house large *enough*? CORRECT

4. **Fairly/rather** – Use *fairly* to modify positive adjectives and *rather* to modify negative adjective.

Akash is *fairly* confident of securing 90% or above in this years' examination. CORRECT

Akash is *rather* confident of securing 90% or above in this years' examination. INCORRECT

Akash is *rather* unsure about how he will fare in the examination this year. CORRECT

Akash is *fairly* unsure about how he will fare in the examination this year. INCORRECT

- 5. Still** – Use *still* to show that something started in the past and continues into the present.

He *still* hasn't given me the answer to my question.

Using the correct Article

There are three articles in the English language – *a*, *an* and *the*.

The articles *a* and *an* are used before singular nouns. In choosing between *a* and *an*, you need to focus on the pronunciation of the word that comes immediately after the article. If that word starts with a vowel pronunciation, go with *an* and if that word starts with a consonant pronunciation, go with *a*.

For example,

This is *a* pen

This is *an* apple.

The is called a definite article and is used when you are trying to refer to a specific noun.

For example,

This is *the* pen that I bought yesterday (*you are talking about a particular pen and not any pen in general*)

This is *the* apple that fell on Newton. (*you are talking about a specific apple and not about apples in general*)

Now that we have revised the theoretical fundamentals, let us look at the application of these concepts in terms of the rules and usages:

Agreement

Subject-verb agreement

*The **verb** of a sentence must agree in terms of **person** and **number** with its **subject**.*

For example, if the subject is in the third-person singular form, the verb should also be in the third-person singular; if the subject is in the first-person plural, the verb should also be in the first-person plural; and so on.

Verb forms

What exactly do we mean by the terms ‘first-person’, ‘third-person’ and so on? And how is a verb expressed in these forms? The following table, which shows the conjugation of the verb ‘to be’ (in the simple present tense) should make it clear.

	First-person	Second-person	Third-person
Singular	I am	You are	He/She/It is
Plural	We are	You are	They are

Unlike in some languages such as French, English verbs do not have to worry about gender agreement. So, English verbs mostly change with respect to number i.e. one or many.

So why is subject-verb agreement such a big deal?

First, it is very easy to make the subject a long winded one and hence to lose the original subject itself. For example: ‘The recent epidemic of contagious diseases has caused a lot of concern to the government’. In this sentence a naive reader may just assume the subject to be diseases instead of epidemic.

Second, some common subjects themselves are prone to confusion. For instance: ‘each’ is singular, ‘the number’ is singular whereas ‘a number’ is plural, etc.

Let’s see some examples where subject-verb agreement can pose a problem.

Example 1

These shoes fits me perfectly.

‘Shoes’ is plural, so it should take the plural form of the verb ‘to fit’. Like all verbs except ‘to be’, the plural form of ‘to fit’ is the same as the infinitive, i.e. ‘fit’. Don’t mistake the ‘s’ at the end of the singular form of a verb for the ‘s’ in the plural form of most nouns! The two have nothing to do with each other.

These shoes fit me perfectly.

Subject-verb agreement errors often occur in cases where the subject and verb of a sentence are far apart.

Example 2

This box of books need to be put away.

Since the plural word 'books' comes right before the verb 'need', it's tempting to think that it is the subject, but in fact the correct subject is the singular word 'box'. It is, in fact, the box that needs to be put away. So the verb should be in the singular form:

This box of books needs to be put away.

Words like 'no one/nobody', 'someone/somebody', 'everyone/everybody', 'anyone/anybody', 'either', 'neither', 'each', 'another', etc. are always considered singular, and therefore take singular verbs.

Example 3

Neither of my sisters are coming to the party.

‘Neither’ is the subject, and it is singular, so the verb should also be singular.

Neither of my sisters is coming to the party.

Collective nouns—i.e. nouns which denote a group of objects, people, etc. can cause some confusion in case of subject-verb agreement. For example, which of the following sentences is correct?

Example 4

The audience do not seem to like the play.

The audience does not seem to like the play.

The collective noun 'audience' is used with a plural verb in the first sentence and with a singular verb in the second. Neither is incorrect in this context as generally speaking, collective nouns can be considered either singular or plural.

In most cases, collective nouns take a singular verb.

However, there are some cases when they have to take a plural verb.

Example 5

The family next door is fighting amongst themselves again.

‘Family’ is a collective noun, and mostly takes a singular verb. But in this context, a plural verb would make more sense, as it is the **individual members of the family who are fighting** (with each other), not the family as a single unit. So the correct form should be:

The family next door are fighting amongst themselves again.

Some More Examples:

Here are some more examples of subject-verb disagreement. The changed parts are underlined in the correct versions.

Incorrect—This pair of shoes feel uncomfortable.

Correct—This pair of shoes feels uncomfortable.

Incorrect—One of my neighbour’s kids have broken my window.

Correct—One of my neighbour’s kids has broken my window.

Incorrect—As the principal walks in, the class sits down in their seats.

Correct—As the principal walks in, the class sit down in their seats.

Pronoun antecedent agreement

As you must already know, a pronoun is a word that stands for a noun or group of nouns. So instead of referring to a particular person or thing by his/her/its name throughout a discussion, we can refer to him/her/it by the pronouns 'he/she/it'.

Example 6

I have lost my pen. Have you seen it?

I watched this film with my brother—He did not like it but I surely did.

The noun that a pronoun stands in for is called its **antecedent**. It may or may not be explicitly stated in the given sentence.

Pronouns can be used for nouns that are the subjects or the objects in a sentence, but most change their forms according to their position in the sentence.

Ravi arrived late this morning—He arrived late this morning.

I gave the letter to Ravi—I gave the letter to him.

At first glance, pronouns may seem quite simple and straightforward. But they can often be a source of confusion in long, complicated sentences, with **multiple possible antecedents**.

A pronoun should clearly refer to only one antecedent.

If there is ambiguity as to which antecedent it refers to, the sentence can be considered erroneous.

Example 7

I bought a new dress and handbag, but I don't like it.

What does 'it' refer to here—the dress or the handbag? It's not clear. It's best to either state which one is meant, or use words like 'former' or 'latter' in order to be specific.

I bought a new dress and handbag, but I don't like the handbag/the latter.

A pronoun must unambiguously refer to an antecedent and agree with its antecedent in terms of person and number.

Example 8

When a person goes for an interview, you should always look your best.

Assuming from the context that 'person' is the antecedent of the pronouns 'you' and 'your', the correct pronouns should be in the third-person singular, just like the word 'person'.

When a person goes for an interview, he/she should always look his/her best.

Sometimes, a pronoun in certain expressions has no antecedents, especially 'it', when used as the subject in sentences stating the time or weather, and occasionally in other situations as well:

It is 10 o'clock right now.

It started raining heavily.

It was obvious whom he was talking about.

Some More Examples

Incorrect—Me and my friend went to a concert last night.

Correct—My friend and I went to a concert last night.

Incorrect—He took the DVD out of the DVD player and examined it carefully.

Correct—He took the DVD out of the DVD player and examined the DVD/the DVD player carefully.

Incorrect—The workers were happy because we were getting a raise.

Correct—The workers were happy because they were getting a raise.

Diction

The Oxford dictionary defines diction as the “the choice and use of words and phrases in speech or writing.” A lot of the words in the English language are easy to confuse as they look or sound similar but convey different meanings. Diction errors are different from grammatical errors: there are no clear rules that can be learnt or even a set list of easily-confused words. Thus, this section is particularly difficult to prepare for. It tests your ability to identify words that don’t make sense because the wrong word has been used.

Diction is in fact a fancy way of saying “choice of words.” In effect, errors of diction are simply errors related to the choice of word in the context of a sentence. Generally, there are two different types of diction errors questions: Identifying Sentence Error Questions and less commonly in Improving Sentences questions.

In order to help you gain an understanding of the words that may be tested on this question type, we have enclosed a list of some commonly confused words for your perusal. Please note that this list is purely indicative in nature and should be used as a base for enhancing your abilities in this section.

Words often confused or misused

Ability	power to do
Abilities	powers and skills, especially of the mind
Capacity	a potential but undeveloped power
Accede	implies actual agreement
Concede	yielding without necessarily agreeing
Admit	used for less serious matters
Confess	implies a personal fault
Affection	a feeling, an emotion or the state of being
Affectation	artificial manner: pretentious display
Alternate	occur in turn repeatedly
Alternative	choice between two or more things
Artisan	a handicraftsman; a mechanic
Artist	a person who practices one of the fine arts
Attenuate	to make slender or thin, or to reduce in force or value
Extenuate	to lessen by partial excuse: to

	mitigate
Beside	at the side of or close to
Besides	in addition to
Capable	able or competent
Capacious	roomy: of large content
Ceremonial	formal
Ceremonious	addicted or showing addiction to ceremony
Collision	violent encounter of moving bodies
Collusion	fraudulent secret understanding between ostensible opponents
Complacent	self-satisfied
Complaisant	obliging
Confidant	person to whom one confides one's private affairs
Confident	feeling or showing assurance
Conscious	awake to one's surroundings or aware of
Conscientious	obedient to dictates of conscience
Continuance	duration
Continuation	going on with: resuming something
Credible	believable

Creditable	praiseworthy
Credulous	too ready to believe
Decry	disparage or condemn
Descry	make out dimly
Depositary	a person entrusted with the safekeeping of something
Depository	storehouse
Economic	pertaining to economy
Economical	saving; frugal
Effectual	answering its purpose
Effective	operative; striking; fit for service
Efficacious	producing desired effect
Efficient	competent; capable
Eligible	desirable; suitable
Illegible	unreadable
Eminent	distinguished; notable
Imminent	about to happen soon
Endemic	regularly found among a people
Epidemic	prevalent for the time among community
Euphemism	substitute of mild for blunt expression

Euphuism	high flown style or writing
Expedient	suitable; advisable
Expeditious	done with or marked by promptness
Factitious	artificial
Facetious	given to or marked by pleasantry
Farther	more far (distance)
Further	in addition to; promote
Forego	to precede or go before
Forgo	go without; relinquish
Historic	noted in history
Historical	belonging in the past
Honorary	conferred by way of honor; unpaid
Honorable	deserving or bringing honor
Human	of or typical of people
	a man, woman, or child
Humane	benevolent compassionate
Humility	humbleness
Humiliation	abasement
Idle	without work
Idol	an image of a deity

Imaginary	existing only in imagination
Imaginative	full of imagination
Imminent	about to happen soon
Immanent	inherent; pervading the universe
Impassable	that cannot be traversed
Impassible	not liable to pain or injury
Imperial	of an empire; of an emperor; supreme
Imperious	domineering; urgent
Industrial	of industries
Industrious	diligent
Judicial	of or by a court of law
Judicious	sensible, skillful
Last	after all others
Latest	most recent
Luxuriant	profuse; florid
Luxurious	fond of luxury; self – indulgent
Mean	ignoble; intermediate
Mien	person's bearing or looks
Momentary	lasting only a moment
Momentous	of great importance

Naught	nothing
Nought	the figure 0
Negligent	heedless
Negligible	that need not be taken account of
Notable	worthy of note; striking
Notorious	known to deserve an ill name
Oar	bladed pole used for steering a boat
Ore	native mineral yielding metal
Official	properly authorised by an office
Officious	intrusively kind, meddling
Ordinance	authoritative direction; decree
Ordnance	department for military stores
Peaceable	disposed or leading to peace
Peaceful	having or marked by peace
Peal	long ringing of bells
Peel	rind of fruit; thin soft bark of young shoots
Persecute	subject to ill treatment
Prosecute	pursue or carry on; institute legal proceedings

Perspicacious	having sight; discerning
Perspicuous	expressed with clearness; lucid
Physic	medicinal drugs
Physique	bodily structure and development
Popular	of the people; generally liked
Populous	thickly populated
Prescribe	lay down authoritatively
Proscribe	exile; ostracise
Presumptive	that may be assumed to be correct
Presumptuous	forward; arrogant
Raise	set upright; make stand up
Raze	completely destroy; wipe out
Regretful	full of regret
Regrettable	undesirable- unwelcome
Reverend	deserving reverence
Reverent	feeling or showing reverence
Rhyme	identity between terminal sounds of words or verse lines
Rime	hoarfrost
Sanatory	tending to health, curative.
Sanitary	of the conditions that affect health,

	especially with regards to dirt and infections.
Seam	line of junction between two edges, especially those of pieces of cloth, etc. turned back and sewn together
Seem	have the appearance of being
Sear	wither or blast
Seer	inspired person
Sere	withered; dried up
Sensual	self-indulgent; carnal; licentious
Sensuous	stimulating or operating through the senses; aesthetic
Sensible	having or showing good sense
Sensitive	touchy or quick to take offence
Sequel	what follows after; after effects; upshot
Sequence	succession; coming after or next
Significance	meaning; importance
Signification	sense or exact meaning or a term etc.
Social	relating to society, living in communities
Sociable	fitted for or disposed to

	companionship or conversation
Spacious	having ample space; roomy
Specious	fair-seeming; apparently good, but not genuine
Spiritual	concerned with the spirit or soul
Spirituos	containing distilled spirit
Straight	without curves or angles
Strait	narrow; strict
Team	a side of players
Teem	to prolific with
Temperance	avoidance of excessive indulgence
Temperament	idiosyncrasy; natural disposition
Temporal	earthly; secular
Temporary	lasting only a short time
Vacation	fixed period of cessation from work
Vocation	occupation or calling
Vain	showy and valueless; conceited
Vane	weathercock
Vein	tube that carries blood from any part of the body to the heart
Vale	valley

Veil	curtain
Verbal	oral
Verbose	prolix
Venal	guilty of taking bribes; mercenary
Venial	excusable
Virtual	such in practice though not in same
Virtuous	morally good
Wave	undulate
Waive	forego
Whit	particle; jot
Wit	intelligence; understanding
Willing	cheerfully ready or given
Willful	committed intentionally
Wreck	destruction or disablement
Wreak	inflict or cause a lot of damage
Yoke	wooden neck piece; bond or union
Yolk	yellow part of egg

Idiomatic errors

Certain nouns or verbs can be used only in a set idiomatic pattern with certain prepositions or adverbs in order to express new meanings or even completely different meanings. Hence, it is important to learn the use of such set of word. Prepositions in conjunction with words are particularly notorious in this regard, as their usage is often not in keeping with their more common meanings.

These are quite a few errors you need to remember.

For example, are the following sentences correct?

Example 9

I am interested into languages.

He is turning in a tyrant.

The prepositions in both sentences—i.e. ‘into’ and ‘in’—have similar meanings in themselves, and so may seem equally valid in either sentence. But as a matter of fact, ‘into’ cannot be used after ‘interested’ and ‘in’ cannot be used after ‘turn’ (in this context, at least); the other way around, however, is completely correct:

I am interested in languages.

He is turning into a tyrant.

Certain verbs can form an idiomatic phrase with certain prepositions or adverbs in order to express new meanings or even completely different meanings. Such verbs are called **phrasal verbs**, and they are a very common feature of English. Many verbs can take a multitude of different prepositions, and express a different meaning with each. For example, does the verb ‘stand’ have anything to do with standing in the following sentences?

Example 10

His strange new hair style makes him **stand out** from the crowd.

She promised to **stand by** her husband, no matter what difficulties he faced.

‘Stand out’ means to be conspicuous. ‘Stand by’ means to support. Neither meaning has anything to do with standing, but in combination with ‘out’ and ‘by’ respectively, the verb ‘stand’ takes on whole new meanings. These meanings are idiomatic, in the sense that they cannot be predicted from the constituent words.

Idioms can also be certain set phrases that have a figurative, not literal, meaning. For example, in the following sentence, does the phrase ‘by heart’ have anything to do with the heart?

Example 11

She has read that book so often that she has almost learnt it **by heart**.

To know or learn something 'by heart' means to memorise it thoroughly. This meaning, clearly, has nothing to do with the literal meanings of 'by' or 'heart'. Similarly, cats and dogs have nothing to do with rain, yet the idiomatic phrase 'cats and dogs' is used to signify heavy rain, as in the following example:

It's just a light drizzle right now, but soon it will be raining cats and dogs.

Some More Examples

Incorrect—Do you think my new hairstyle is very different than my old one?

Correct—Do you think my new hairstyle is very different from my old one?

Incorrect—He prefers rock music above classical music.

Correct—He prefers rock music to classical music.

Incorrect—She was glad enough to come first in her class, but winning a scholarship as well was the iced cake.

Correct—She was glad enough to come first in her class, but winning a scholarship as well was the icing on the cake.

Verb form

While agreement between the verb and its subject is important, it is also important to check to make sure that the verb tense makes logical sense in the context of the sentence. The tense of a verb is the time the action it refers to takes place in. In English, there are three main tenses:

1. Present
2. Past
3. Future

This may seem intuitive enough—but there is more to tense than just that. Each tense can further be expressed in one of three aspects:

Simple: The Simple aspect is just what its name implies: the simplest form of any tense; it merely shows that the given action takes place in the particular time indicated by the tense.

Progressive/Continuous: The Progressive aspect indicates that the action is in progress at the particular time indicated by the tense.

Perfect: The Perfect aspect indicates that the action is complete at the particular time indicated by the tense.

The following tables show the verbs ‘to be’ and ‘to close’(as an example of most other verbs) in all three tenses with all three aspects.

To be:

	Present	Past	Future
Simple	am/are/is	was/were	will be
Progressive/Continuous	am/are/is being	was/were being	will be being
Perfect	have/has been	had been	will have been

To close:

	Present	Past	Future
Simple	close	closed	will close
Progressive/Continuous	am/are/is closing	was/were closing	will be closing
Perfect	have/has closed	had closed	will have closed

Tense consistency errors occur when the tense of a sentence does not match the overall context, or when it changes abruptly in a sentence (in cases when there is more than one verb in a sentence), without any external reason for the change.

*A correct sentence would ensure that the verbs used in the sentence are in the **correct tense and are constructed in parallel form.***

Example 12

I see this film yesterday.

If the event occurred 'yesterday', i.e., in the past, then the verb should be in the past not present tense. The correct form should be:

I saw this film yesterday.

Example 13

I ate my dinner and have dessert.

Since the first verb 'ate' is in the simple past, then the second verb 'have' should also be in the past, as there is no reason to assume that the two events happen at different times. The correct version can be:

I ate my dinner and had dessert.

Not all tense changes in a sentence are incorrect, however.

If the time-frame of an action changes, then the tense can change accordingly.

Example 14

I am eating my dinner right now, and later I will have dessert.

In the above sentence, two actions are described, both in different tenses (present progressive and simple future), but the words 'right now' and 'later' make it clear that they occur at different times. So, there is no tense error.

The **aspect of a verb** is also a factor that is prone to errors.

*The **simple aspect** shows a habitual action, while the **progressive** is restricted to actions that are in progress at a particular point of time.*

Example 15

He was playing cricket in his college days.

The above sentence is incorrect, as he cannot possibly have played cricket constantly throughout his college days—rather, it was something he did habitually. So the verb ‘play’ has to be in the simple past:

He played cricket in his college days.

On the other hand:

Example 16

He played cricket when the accident occurred.

The above sentence is incorrect for the following reason.

*When a specific, one-time event is stated to happen at the same time as another action, that action should be in the **progressive** aspect.*

So the correct form is:

He was playing cricket when the accident occurred.

*Similarly, the **perfect** aspect is used to show that an action has been completed at a particular point in time or before another action occurred.*

Example 17

We already bought the tickets, when she said she couldn't come.

The context makes it clear that buying the tickets occurred and was completed before she said she couldn't come. So the verb 'buy' has to be in the past perfect tense:

We had already bought the tickets when she said she couldn't come.

Universal facts *are always stated in the simple present tense, no matter what tense the rest of the sentence is in.*

Example 18

We learnt in Geography class that the South Pole was in Antarctica.

The South Pole is always in Antarctica, i.e., it is a fact that does not change with time. So it should be in the simple present tense here:

We learnt in Geography class that the South Pole is in Antarctica.

There are many more ways in which tense errors can crop up, and the above are only a few common ones. It is not possible to list all the situations. But hopefully, you now know enough to be on the lookout for tense errors.

Some More Examples:

Incorrect—You are telling the same story at every party.

Correct—You tell the same story at every party.

Incorrect—She will leave for London by this time tomorrow.

Correct—She will have left for London by this time tomorrow.

Incorrect—Until just a few centuries ago, people did not know that the earth orbited the sun.

Correct—Until just a few centuries ago, people did not know that the earth orbits the sun.

No mistake

While attempting questions on error identification, it is important to remember that it is not necessary for every question to contain an error. When going through the different portions of the sentence, check for grammatical errors, position and nature of the verb, diction and construction. If you are unable to spot any inconsistency don't create errors forcibly. Consider the option that the sentence might be correct as written.

Others

Modifiers

A modifier is a **word, phrase or clause which modifies** (i.e., says something more about) **another word or phrase** in that sentence. Ideally, a modifier must be **placed next to the word or phrase it modifies**. When it isn't placed in this position, especially such that it results in confusion or a bizarre idea, we get a modifier error.

Example 19

She wore a gold bracelet on her wrist, which cost a lot of money.

The modifying clause 'which cost a lot of money' obviously refers to the bracelet not the wrist, so it should be next to that word. The sentence needs to be rephrased in one of the following ways in order to correct this error:

She wore a gold bracelet, which cost a lot of money, on her wrist.

She wore on her wrist a gold bracelet, which cost a lot of money.

On her wrist, she wore a gold bracelet which cost a lot of money.

Modifier errors can be broadly classified into two types:

1. Misplaced Modifier
2. Dangling Modifier

Misplaced Modifier

The above example is of the former type, i.e. one in which the modifier has been placed incorrectly in the sentence, and simply shifting it into the correct position can correct the error.

Here's another example of misplaced modifier, in which the modifier is a single word.

Example 20

Once I moved to the front of the classroom, I could hear the professor speaking clearly.

In the above sentence, what does the adverb 'clearly' modify? The verb 'hear' or 'speaking'? It most likely modifies 'hear', but the sentence is still ambiguous. Moving the modifier next to the verb it modifies makes the sentence much better:

Once I moved to the front of the classroom, I could clearly hear the professor speaking.

Dangling Modifier

Dangling modifier errors are more complicated, as in those cases, the modifier does not apply to any word directly stated in the sentence, as that word is only implicit in the context.

Example 21

Thinking about his life so far, there seemed to be so many mistakes.

Who is thinking about his life in this sentence? We can assume there is a 'he' involved, but it is not stated in the sentence. The sentence needs to be rephrased thus to include the name of the person doing the thinking, or a suitable pronoun:

Thinking about his life so far, he seemed to have made so many mistakes.

Please note that correcting this error also involves rephrasing the second half of the sentence substantially.

Some More Examples

Let's see a few more examples of each of these types of errors and how to correct them.

Misplaced modifiers:

Incorrect—I saw a gift that would be perfect for my cousin in the shop window.

Correct— In the shop window, I saw a gift that would be perfect for my cousin.

Incorrect—We go to the beach to watch the waves crash on the rocks every Saturday.

Correct—Every Saturday, we go to the beach to watch the waves crash on the rocks.

Incorrect—He accidentally hit his brother with a bat in the head.

Correct—He accidentally hit his brother in the head with a bat.

Dangling modifiers:

Incorrect—While serving dinner, the plate fell from her hands and broke.

Correct—While she was serving dinner, the plate fell from her hands and broke.

Incorrect—After waiting for an hour at the bus stop, there was still no sign of the bus.

Correct—After waiting for an hour at the bus stop, I/he/she/we/they could still see no sign of the bus.

Incorrect—Having seen the Taj Mahal, Humayun's tomb is more impressive.

Correct—Having seen the Taj Mahal, she thinks that Humayun's Tomb is more impressive.

Note: The categorisation of modifiers into these two types is only in order to better acquaint you with the range of modifier errors. Please note that you will never need to differentiate between the two in grammar-related questions in aptitude tests. The differentiation is for your own knowledge only.

Parallel construction

Parallel Construction refers to the structure of a sentence in which certain words, phrases or clauses that have a similar logical/grammatical status are expressed in a similar manner. When these words, phrases or clauses—i.e. the **parallel elements**—are not expressed in the same grammatical form, you get a parallel construction error.

Example 22

In my free time, I like to read, watch TV and playing video games.

The sentence involves three activities of the same status—i.e. that are **parallel**. So they all should be in the **same grammatical form**. The first two parallel verbs—‘read’ and ‘watch’—are in the **infinitive form**. But the third one—‘playing’—is in the **gerund/present participle form**. It should also be in the infinitive, i.e. ‘play’. This is how the sentence should be correctly framed:

In my free time, I like to read, watch TV and play video games.

In grammar, it is essential that all parts of speech, i.e. nouns, verbs, adjectives, adverbs, etc., as well as larger parts, like phrases and clauses be constructed in a parallel form in the sentence.

For example, here’s one with nouns:

Example 23

Please remember to bring your textbooks, pens and your notepads.

In this case, 'your' already applies to all the three items, i.e. 'textbooks', 'pens' and 'notepads', so there is no need to repeat it before the last one.

Please remember to bring your textbooks, pens and notepads.

Here's another example involving clauses:

Example 24

Either you should exercise more or eat less if you want to lose weight.

*In case of **correlative conjunctions** (i.e. conjunctions that appear only in pairs) like 'either ... or', 'neither ... nor', 'not only ... but also', etc., the parts of the sentence after each one should be parallel.*

So in this case, 'either' should come before 'exercise', as it is parallel to 'eat less', which comes after 'or':

You should either exercise more or eat less if you want to lose weight.

Not all sentences which include lists involve parallel construction, however. Beware of over-generalizing! For example, see the following sentence. Is it correct?

Example 25

The maid washed the dishes, the clothes, and dusted the furniture.

This sentence is incorrect, because the three activities are not parallel. 'The dishes' and 'the clothes' are parallel, as they are the objects of the same verb 'washed'; but 'dusted the furniture' involves a separate verb and is therefore a separate activity. This is the correct form of the sentence:

The maid washed the dishes and the clothes, and dusted the furniture.

Parallel construction is also important **when comparing** two or more things. The compared items must be parallel, so it is vital to ask exactly what is being compared to what.

Example 26

The population of my city is much greater than the capital city.

In the above sentence, the population of one city is being compared not to the population of another, but to the city itself! Obviously this is incorrect, and the correct form should be:

The population of my city is much greater than that of the capital city.

Some More Examples

Let's see some more examples of parallel construction errors and how they can be corrected.

Incorrect—We are going for a hike and rock climbing.

Correct—We are going for hiking and rock climbing.

Incorrect—This meeting is not about finding fault, but finding a solution.

Correct—This meeting is not about finding fault, but about finding a solution.

Incorrect—This flat is nice, but the view is not as pretty as the flat we saw yesterday.

Correct—This flat is nice, but the view is not as pretty as that of the flat we saw yesterday.

Now, let us understand the application of these concepts on the various types of questions that are asked on error identification.

1. Agreement

Priscilla and I was punished by the teacher for not
completing the assignment on time.

- (A) Priscilla and I
- (B) was punished
- (C) not completing
- (D) on time
- (E) No error

Solution

The plural subject Priscilla and I does not agree with the singular verb was. Thus, B is the error—the singular was needs to be changed to the plural were.

The correct answer is B.

2. Diction

Though Rohan was not implied in the class bunking issue he was still questioned by the principal.

- (A) was not implied
- (B) in the
- (C) he was
- (D) by the principal
- (E) No error

Solution

The use of the word 'implied' is incorrect in this context. Implied refers to something that is suggested, not stated explicitly. The word required in this context is 'implicated' which is synonyms with incriminating someone, showing someone to be involved in a crime.

The correct answer is A.

3. Verb Form

Cristina starting the test later than the rest of the students but was still able to complete it in the allotted time.

- (A) starting the
- (B) later than
- (C) but
- (D) it
- (E) No error

Solution

The first clause of the sentence—Cristina starting the test later than the rest of the students—does not contain a verb whereas a verb is needed here. Starting, which is a participle, needs to be change to started the, the verb.

The correct answer is A.

4. No mistake

According to leading economists across the world, rising inflation is one of the factors that seem to indicate that an economy might be headed for a recession.

- (A) across the world
- (B) rising inflation is
- (C) that seem to indicate
- (D) might be headed
- (E) No error

Solution

There is no error in the sentence. The plural subject 'factors' correctly agrees with the plural verb 'seem'. 'Seem to' is also the correct idiomatic construction.

The correct answer is E.

5. Others

While some may doubt the feasibility of the proposal, it is based on empirical evidence, unlike policies that result from either fanciful suppositions or from political whims.

- (A) doubt the feasibility
- (B) it is based
- (C) unlike policies that
- (D) from political whims
- (E) No error

Solution

The sentence has an error of parallel structure. Whatever comes after either, the same construction has to be repeated after or. Since either is followed by a noun phrase, or should also do the same. Instead or is followed by the preposition from. The correct answer should read, 'result from either fanciful suppositions or political whims'.

The correct answer is D.

Quick tips and strategies

These are some guidelines that can be helpful when solving grammar-related questions:

- While reading the original sentence, be careful of **error in article, subject verb agreement, pronoun antecedent agreement, cases of pronoun, modifiers, tense, parallelism etc.**
- Whenever you see a verb, find its subject, see whether it **agrees in number, tense and person with its subject(s).**
- Whenever you see a pronoun, find whether it has a **clear antecedent** and if it does whether it agrees in gender and number. Also check the case of the pronoun - it should be in correct form as per its case.
- Modifiers and parallel construction sentences can be spotted by the **use of commas**. Be careful about these errors in sentences with commas.
- When you have to identify correct or incorrect sentences, it is always safer to **focus on finding errors**.

4.11 Prepositions

4.12 What is Measured?

The questions on prepositions test you with respect to the correct usage of words and phrases. They involve testing on idiomatic expressions, phrasal verbs, diction and grammatically fixed usages.

4.13 Overall Test Taking Strategies

1. Avoid using the ear (or what *sounds* correct) to answer questions. Try to apply the grammar rules instead.
2. Make it a habit to read a good newspaper or magazine regularly as this will help you identify the correct usage of prepositions.

Introduction

Prepositions are words that provide some additional information to whoever is reading the sentence. This information can include where something takes place (such as 'at' the mall), when or why something takes place (such as 'after' lunch), or general descriptive information (such as the man 'with' the golden gun). Remember that prepositions are always followed by a noun; they are never followed by a verb.

Prepositions for place – above, across, along, at, behind, below, beside, between

Prepositions for position – down, by, from, in, in front of, into, inside, near, off

Prepositions for direction – on, opposite, outside, over, around, through, to, towards, up

Prepositions for time – at, after, before, by, during, for

Other important prepositions – as, like, about, with, without, for

Here are a few important points to be remembered with respect to prepositions:

A preposition is usually placed before its object, but sometimes it is placed after it. Examples:

Who are you talking to (Incorrect: To whom are you talking?)

What are you looking for (Incorrect: For what are you looking?)

Which of these chairs did you sit on? (Incorrect: You sat on which of these chairs?)

A word may be used as an adverb or a preposition. One decides its role on the basis of the position and function of the word in that particular sentence.

Example:

- She walked **up** the stairs and entered the chamber. (Preposition)
- Rahul took the **up** escalator and reached the top of the apartments. (Adjective)
- The businessman **upped** his offer by a million rupees and bought the house. (Verb)
- The teacher agreed to take up the matter with the higher authorities. Particle ('take up' = phrasal verb)
- His business venture is on the **up**. (Noun)
- Getting her to agree to anything is an **uphill** task.

Use of 'As' and 'Like'

As is used both as a conjunction and as a preposition:

- *The crowd rejoiced as the Sun came up.* (conjunction)
- *India is as big as Brazil.* (conjunction)
- *Mr. Singh has been very successful as a minister.*
(preposition)

'Like' is generally used as a preposition and is therefore followed by a noun, pronoun or a gerund.

- *Personalities like Mr. Nehru, former Prime Minister of India, still inspire people.*
- *There is nothing like having a hot cup of tea on a cold morning.*

Note: Use 'like' to compare nouns and 'as' to compare clauses.

- Sanjay is a good student, *like* his brother.
- You should behave with others as you would want them to behave with you.

Use of 'In' and 'Into'

The key difference between 'in' and 'into' is that 'in' indicates a state of being, whereas 'into' indicates motion. For example, 'into' is often used to describe the movement of something from outdoors to indoors, such as in the sentence, "I walked *into* the house. By contrast, in is used when a thing or person is stationary. For example, "I found the book *in* the drawer.

Use of 'On' and 'Onto'

Similar to 'into' and 'in', 'onto' indicates motion where 'on' does not. 'Onto' normally indicates that something is placed onto something else. For example, "I put the dishes *onto* the table when I set it. On shows that something already rests on a surface. For example, The picture is hanging *on* the wall.

Use of 'Among' and 'Between'

'Among' and 'between' are almost exactly the same in meaning. However, 'between' is used when something is placed between two objects. 'Among', on the other hand, is used when something is placed among many objects.

Use of 'Beside' and 'Besides'

'Beside' - without an s - means 'next to'. For example, "Tom is seated *beside* Alice. In contrast, Besides - with an s - states that something is in addition to something else. For example, "*Besides* math, Peter is getting an A in history.

Use of 'For' and 'Since'

'For' is use with periods of time. For example, "They were married for 20 years". On the other hand, 'since' is use with specific points in time. For example, "They have been married since 1982."

Choose the correct preposition

In this question type, you will be given three separate sentences with one blank in each. Below these sentences, you will be given 6 prepositions labelled (a) to (f). Finally, you will be given five answer choices with some possible combinations of these prepositions. You need to identify the combination that can correctly go into each of the three blanks.

Let us take a look at an example:

1. We walked _____ the river bank until we found our clothes.
2. John was accused _____ cheating in the exam.
3. The MD apologised _____ the delay in launch of the product.

(a) in

(b) along

(c) of

(d) to

(e) for

(f) by

(A) bce

(B) cbe

(C) ecd

(D) dce

(E) fce

Solution

You walk *along* the river bank.

You are accused *of* something.

You apologise *for* something.

The correct answer is A.

As you can see, these questions are not testing you on any specific grammar rule as such; rather, they are testing you on the usage of words and phrases. It again helps if you have been in the habit of reading as you may then be able to recall the correct use of these prepositions. If you are not in the habit of reading, it makes sense to start reading a good newspaper or magazine.

In terms of the concept knowledge required, grammar-based questions are possibly the most difficult type of questions in aptitude tests. But don't let that put you off. Getting good at grammar is worth the effort, as it not only helps you out in grammar-based questions—which are a regular feature in all aptitude tests—but also helps you gain a firmer grasp on the English language itself, which in turn will help you with reading-based questions, as well as with your spoken English.

4.14 Sentence Completion

4.15 What is Measured?

Sentence completion questions can test your vocabulary, grammar skills, usage skills and/or reasoning skills. That's because the missing word can be any part of speech or any kind of word (i.e. a short, common one or a long, obscure one), and may fit into the sentence in any way.

4.16 Overall Test Taking Strategies

1. The best method is to create **shadow words**, i.e. likely words that could fill the blanks in the sentence, when reading the sentences for the first time.
2. Note the **tone of the sentence**.
3. Pay attention to the **keywords** and **connectors**.
4. Brush up on your knowledge of **prepositions and idioms**, as grammar-based sentence completion questions focus strongly in these areas.

Introduction

Sentence completion questions are staples of aptitude tests. Most tests have them in some version or the other.

You may have had sentence completion type questions even in school exams, so the format is probably familiar. Basically, it's exactly what the name says: **a sentence (or paragraph) is given with one or more words missing, indicated by a blank.** You have to fill in the correct word/s from the options given, going by the context of the rest of the sentence (or paragraph). In short, a key skill that you need for sentence completion is a bit of common sense!

Of course, the questions are not always as simple. As the name suggests, these questions will consist of a sentence or a group of sentences containing one or two blanks. There will be some options given to you for each blank and you will need to select the correct word from those options that can be put into that blank.

The key thing to keep in mind is that the word that goes into the blank(s) cannot be a figment of your imagination; rather, it has to make sense with the meaning conveyed by the rest of the sentence. This is where the comprehension part comes in. **By giving these fill in the blank questions on the test, the NMAT by GMAC™ is not just testing you on vocabulary but also on comprehension.**

Types of questions asked

Sentence completion questions can be classified on the basis of how many blanks the sentence has, or whether they consist of a sentence or a paragraph. There can also be experimental types of sentence completion questions, in which the blank is done away with altogether!

Let's see these varieties one by one.

Single blanks

Single blank sentence completion questions are the most basic type of Fill in the Blanks and the other varieties are variants of them.

Double blanks

There is not much need to explain what these entail—this type of sentence completion consists of sentences with two blanks instead of one.

Double blank sentence completion questions can be simply a double version of single blank Fill in the Blanks, i.e. sentences with two independent missing words instead of one, or they can be slightly trickier, with two missing words that depend on each other based on their meaning. In the latter case, each of the options has to be first evaluated to see if the two words do indeed have the necessary connection and then checked against the sentence to see if they fit the overall meaning.

As sentence completion questions are not very reading-intensive, they can **help you score more marks in very little time**. So make sure you give these questions their due attention!

One big advantage of solving sentence completion questions is that it takes less time per question to solve them. So be sure you have your basic strategy for this question type in place.

Grammar, diction and usage issues

As mentioned above, questions based on sentence completion assess various aspects of the language – grammar, comprehension, diction and appropriate usage. Therefore, we are providing a quick review of the key vocabulary concepts and their applications. These will prove helpful not only for this question type but even for questions based on comprehension and analogies. The concepts of grammar and diction have been reviewed in the section on error identification.

The correct use of words is crucial for all aspects of a competitive examination. Correct usage includes identifying the contextual usage, appropriateness of a word with respect to tone, nuances and logic. All of these require an in-depth and comprehensive understanding of vocabulary wherein you not only understand the dictionary meaning of a word but also its various applications and usages.

Keeping this in mind, the next few pages are devoted to helping you enhance your competencies in this section.

Let us begin with a quick review of the concepts of vocabulary.

Root words

A root word is the most basic part of a word. It is what remains after the various affixes have been removed.

Prefixes

A prefix refers to an alphabet or a group of alphabets that comes at the start of a word and assists in indicating or modifying its meaning. For example: the word 'prefix' starts with the prefix *pre-*, which means '*before*'.

An understanding of the different prefixes can prove quite beneficial in order to understand the meaning of words and build associations. However, at times a prefix can indicate multiple meanings. For example, the prefix *im-* can mean 'not' or 'into'.

Suffixes

A suffix refers to an alphabet or a group of alphabets that comes at the end of a word to form a new word or alter its grammatical function.

Suffixes also assist in delineating the meaning of a word.

Given below is a list of some commonly used word roots, prefixes and suffixes. You are advised to go through the list and use it to build your vocabulary.

Root, Prefix, or suffix	Meaning	Examples
a-	without	amoral, amorphous, asexual
ambi-	on both sides	ambidextrous, ambivalent
ante-	before or in front	antecedent, antedate
anti-	against	antipathy, antisocial
aqu/aqua-	water	aquatic, aqueous, aquarium, aqueduct

Root, Prefix, or suffix	Meaning	Examples
bene-	good	benefit, benediction, benevolent
bi-	two	bifurcate, biannual, bisect
bio-	life	biology, biography, biome
cede/ceed	go or yield	precede, exceed, recede
circum-	around	circumscribe, circumnavigate, circumvent
contra-	against or opposite	contradiction, contraception, controversy
cycl	circle	bicycle, cyclical
de-	reduce or remove	deescalate, defenestrate, decelerate
di-, dis-	apart or away	digress, disappear, diverge

Root, Prefix, or suffix	Meaning	Examples
dict	speak or say	edict, dictation, dictator, prediction, contradiction
dox	belief	orthodox, paradox, heterodox
du-, duo-	two	dual, duology, duochrome
em-, en-	into, in	embrace, enclose, encircle
esce	becoming	coalesce, adolescence, obsolescent, tumescent
ex-	out or way	exit, exhale, extirpate, exile
extra-, extro-	beyond or outside	extraordinary, extraterrestrial
fid/e	faith	bonafide, fidelity, confide
fore	before, previously, earlier	forestall, before, forebear, forebode, forecast

Root, Prefix, or suffix	Meaning	Examples
gram	writing, letters	diagram, grammar, epigram, telegram
graph	writing, recording	stenography, autograph, graphics
hetero-	different	heterosexual, heterozygous, heterogeneous, heterodox
homo-	same	homogenous, homosexual, homologous
hyper-	excessive	hyperactive, hyperbole
hypo-	under, below	hypothermia, hypocrite, hypoglycemic
inter-	between	intercede, interlude
intra-/intro-	inside, within	introvert, intramural, intravenous

Root, Prefix, or suffix	Meaning	Examples
junct	joining	juncture, conjunction, disjunction
-less	without	listless, aimless, heartless
-logy	the study of	biology, geology, psychology
mal, male	bad, evil	malediction, malice
mis-	bad or incorrect	misprint, misbehave, misstep
-ness	state of being	likeness, greatness
non-	not, without	nonfiction, non-resident
ob-	against or before	obdurate, obfuscate
omni-	all, everything	omnipotent, omniscient, omnivorous
pedi, pede	foot	pedestrian, pedicure

Root, Prefix, or suffix	Meaning	Examples
phil	love or affinity	bibliophile, philanthropy
pre-	before or earlier	pretest, preamble
pro-	before or forward	proceed, prologue
re-	again, backwards	reaction, rebound, reuse
sub-	under or lower	submarine, subprime
temp	time	temporal, contemporary, temporarily
tort	twist	tortuous, contortion
trans-	across or beyond	transnational, transit
un-	not or opposite	unimpressive, unwanted, unwarranted

Taking words apart

Word	Prefix	Root	Suffix	Meaning
Concurrence	con: with	curr: run	ence: act of	Act of existing or occurring at the same time
Exaggerate	ex: out	ag: to do, act	—	To overstate or overemphasize
Irreversible	ir: not	vers: turning	ible: able to	Irrevocable, that which cannot be undone
	re: again			
Malediction	male: bad	dict: to say	—	Damnation, curse or evil words
Precursor	pre: before	curs: to run	or: one who	Forerunner, antecedent
Unity	uni: one	—	ty: state of	State of being united
Untenable	un: not	ten: holding	able: able to	A point of view that cannot be argued or defended

Suffix	Meaning	Example
Verb suffixes		
-ate	become	mediate, collaborate, create
-en	become	sharpen, strengthen, loosen
-ify, -fy	make or become	justify, simplify, magnify, satisfy
-ise, -ize	become	publicise, synthesise, hypnotise
Adjective suffixes		
-able, -ible	capable of being	edible, fallible, incredible, audible
-al	having the form or character of	fiscal, thermal, herbal, colonial
-esque	in a manner of or resembling	picturesque, burlesque, grotesque
-ful	notable for	handful, playful, hopeful, skilful
-ic, -ical	having the form or character of	psychological, hypocritical, methodical, nonsensical, musical
-ious, -ous	characterised by	pious, jealous, religious, ridiculous
-ish	having the quality of	squeamish, sheepish, childish
-ive	having the nature of	inquisitive, informative, attentive
-less	without	meaningless, hopeless, homeless
Noun suffixes		
-acy	state or quality	democracy, accuracy, lunacy
-al	the action or process of	remedial, denial, trial, criminal
-ance, -ence	state or quality of	nuisance, ambience, tolerance
-dom	place or state of being	freedom, stardom, boredom
-er, -or	person or object that does a specified action	reader, creator, interpreter, inventor, collaborator, teacher
-ism	doctrine, belief	Judaism, scepticism, escapism

Suffix	Meaning	Example
-ist	person or object that does a specified action	Geologist, protagonist, sexist, scientist, theorist, communist
-ity, -ty	quality of	extremity, validity, enormity
-ment	condition	enchantment, argument
-ness	state of being	heaviness, highness, sickness
-ship	position held	friendship, hardship, internship
Adverb suffixes		
-ly	related to or quality	softly, slowly, happily, crazily, madly
-ward, -wards	direction	towards, afterwards, backwards, inward
-wise	in relation to	otherwise, likewise, clockwise

These affixes can have a dramatic impact on the meanings of words. Knowledge of various prefixes and suffixes can help you build understanding of words, their meanings and usages.

Keep in mind that even though affixes are required for forming words, they cannot stand alone in a sentence as they are not words in their own rights.

Idioms and phrasal verbs

Idioms are a group of words/ expression that have a figurative meaning- a meaning separate from the literal meaning conveyed by the constituent words. Questions on sentence completion also involve correct usage and idiomatic/phrasal expression. Therefore, a comprehensive knowledge of idioms/phrasal verbs and their usage shall be of great assistance, not only for the examination, but also for enhancing your understanding and comprehension of the language.

NOTE: Do not confuse idioms with idiomatic usage. Here is a list of some common idioms and constructions that are tested for idiomatic usage of words.

Idioms

Idiom	Meaning	Example
A bitter pill	A situation or information that is unpleasant but must be accepted	Dropping the catch off the final ball was a bitter pill for the captain to swallow.
A curate's egg	Something with both good and bad parts or qualities	The new book by the author is a bit of a curate's egg.
A dime a dozen	Anything that is common, inexpensive, and easily available	These jackets are available a dime a dozen.
A fish out of water	A person who feels uncomfortable or awkward because he or she is in surroundings that are not familiar	She felt like a fish out of water at the party.
A golden handshake	A large sum of money that is paid to a retiring manager or director, or to a redundant worker	The President will get a golden handshake and a pension as well.

Idiom	Meaning	Example
A good egg	A person who you can rely on to behave well	My brother is such a good egg that everyone likes him.
A rotten apple	Someone who does bad things and influences other people so that they do bad things too	Don't listen to her. She is a rotten apple.
Ace in the hole	A secret advantage	The trainer was certain that the new strategy would turn out to be an ace in the hole.
Achilles' heel	A small fault or weakness in a person or system that can result in its failure	Laziness has always been her achilles heel.
Actions speak louder than words	Intentions are judged better by what is done than by what is said	Your actions always speak louder than your words.

Idiom	Meaning	Example
Add insult to injury	To worsen an unfavourable situation or a loss	First, he did not turn up for the party and to add insult to injury, has not returned any of Shaina's calls.
Back to the drawing board	To start again from the beginning planning an event; idea or scheme as When an attempt fails, and it's time to start planning all over again	The product has not done well, so we are back to the drawing board.
Beat around the bush	To discuss a topic but omit its main points, often intentionally or to delay or avoid talking about something difficult or unpleasant	Even though she knew exactly what she wanted, she kept beating around the bush for an hour before broaching the topic.

Idiom	Meaning	Example
Bite the bullet	To endure a painful or unpleasant situation that is unavoidable	If we want to increase the revenue, we will have to bite the bullet about the expenditure.
Blue pencil	To censor something, or limit the information that is shared	The word 'adultery' immediately caught her eye and she thought it was best to blue pencil it.
Break a leg	Used to wish someone good luck	Go on Joe! Break a leg!
By the skin of your teeth.	To only just manage to do	I managed to catch the flight by the skin of my teeth.
Chase rainbows	When someone tries to get or achieve something that is difficult or impossible	He is just wasting his time chasing rainbows.

Idiom	Meaning	Example
Chew the fat	To chat idly or generally waste time talking	I haven't seen you for a long time. Let's meet up and chew the fat.
Chicken out	To decide not to do something out of fear (usually just before)	We all decided to go bungee jumping, but he chickened out at the last moment.
Chink in one's armor	An area of vulnerability	His arrogance is a serious chink in his armour.
Dropping like flies	Dying/giving up quickly	The home team is dropping like flies.
Eager beaver	A person who is excited about doing certain work	The new joinee is an eager beaver.

Idiom	Meaning	Example
Elephant in the room	A problem or controversial issue that is too big to ignore, but one that everyone tries to avoid talking about because it is embarrassing or will cause conflict	We all sat quietly around the table; no one wanted to bring up the elephant in the room about Ella's suicide.
Half a loaf is better than no bread	Something is better than nothing	I know I am being paid less than I deserve but I guess half a loaf is better than no bread.
Hold your horses	Wait and be patient	Hold your horses just a little longer! Dinner will be served shortly.
In the black	Meaning successful or profitable	The CEO announced that despite all hurdles, the organisation was in the black.

Idiom	Meaning	Example
Kill two birds with one stone	Get two things done at once	This new policy aims to kill two birds with one stone.
Let the cat out of the bag	Reveal a secret	She accidentally let the cat out of the bag at the party.
Nail your colours to the mast	To say publicly and firmly what you believe or who you support	In his latest speech, the young prince has nailed his colours to the mast.
Nest egg	Money saved for the future	My father was forced to use his nest egg for his surgery.
Red Herring	A “red herring” is a piece of information that draws attention away from the real facts of a situation	The news of his arrest turned out to be a red herring.

Idiom	Meaning	Example
Red in tooth and claw	Involving opposition or competition that is violent and without pity	Come election time, the competition between the two parties will be red in tooth and claw.
Scream blue murder	is to scream loudly and for a long time, especially in order to protest about something	Ana screamed blue murder when she saw the snake.
Still waters run deep	Means a person who seems to be quiet or shy may surprise you by knowing a lot or having deep feelings	Don't be too quick to judge him. Still waters run deep!
Straight from the horse's mouth	Directly from the original source	I had it straight from the horse's mouth that Salman Rushdie is coming at the book launch.

Idiom	Meaning	Example
Take it on the chin	To be brave and not complain when bad things happen to you	You should learn to take criticism on your chin.
The apple doesn't fall from the tree	A child usually behaves in a similar way to his or her parent(s)	I am not surprised at his behaviour. The apple doesn't fall far from the tree.
The apple of somebody's eye	Used to indicate the person who someone loves most and is very proud of	Our dog is the apple of everybody's eyes at home.
The best thing since sliced bread	An excellent person or thing	This cake is the best thing since sliced bread.
The icing on the cake	Extra and not essential element that is added to an already good situation or experience and that makes it even better	Going swimming was an icing on the cake for the children.

Idiom	Meaning	Example
To drag your feet.	To be deliberately slow	My boss has been dragging his feet over my promotion.
To get someone's back up	To really annoy someone	My sister always manages to get my back up.
To give/lend colour to	To give the appearance of truth	He splashed mud over his truck to lend colour to his story about being in the forest all weekend.
To have your back to the wall.	To be in a difficult or desperate situation	I have my back to the wall on this project.
To look through rose-coloured/ tinted spectacles/ glasses	When someone sees things in an overly flattering or over-optimistic light	Marie has a penchant for always looking at things through rose-tinted glasses.

Idiom	Meaning	Example
To raise eyebrows.	To shock people.	The dress she wore to the ball raised a lot of eyebrows.
Water off a duck's back.	Criticisms of or warnings to a particular person that have no effect	Anything you say to her is water off a duck's back.
White Elephant	An expensive item that is costly to maintain	That yatch is a white elephant.
Xerox Subsidy	Using the office photocopier for personal use	The office has a strict policy about xerox subsidy.

Phrasal verbs

Phrasal verb	Meaning
Abide by	To accept a decision, a law or a rule
Account for	To provide an explanation
Add up	To amount to, make sense
Advise against	To counsel someone not to do something
Agree with	To have the same point of view as another
Allow for	To take into account, to consider
Appeal to	To beg or plead To be attractive or interesting
Apply for	To request for something in a formal way (job, permit, loan etc.)
Back away	To retreat, out of fear or dislike
Back down	To admit defeat
Back up	To support or encourage To make a copy of (file, programme, etc.)
Bank on	To place one's hopes on something / someone
Black out	To faint, lose consciousness

Phrasal verb	Meaning
Block off	To separate using a barrier.
Blow up	To explode To get angry
Boil down to	as the crux of a matter, the key point/s
Boot up	To start a computer by loading an operating system or programme
Break away	To separate from a crowd
Break down	To stop operating, functioning To lose control of one's emotions
Break into	To enter by force
Break out	To start suddenly
Break out of	To escape from a place by force
Break up	To come to an end (marriage, relationship)
Bring up	To raise (a child)
Brush up on	To improve, refresh one's knowledge of something
Bump into	To meet by chance or unexpectedly
Burn out	exhaustion caused due to extreme work
Call back	To return a phone call
Call off	To cancel

Phrasal verb	Meaning
Calm down	To relax, lose anger or stress
Carry on	To continue
Carry out	To do something as specified (a plan, an order, a threat) To perform or conduct (test, experiment)
Check in	To register at a hotel or airport
Check out	To settle one's bill and leave (a hotel) To investigate
Clam up	To stop speaking
Clamp down on	To act strictly to prevent something
Come across	To find by luck To appear, seem, make an impression
Come forward	To present oneself
Count on	To rely or depend on (for help)
Cut down on	To reduce in number or size
Cut out	To remove using scissors To stop doing something
Deal with	To handle, take care of (problem, situation)
Die down	To calm down, become less strong
Do without	To operate without

Phrasal verb	Meaning
Drag on	To last unnecessarily longer than required or expected
Draw up	To create (contract, agreement, document)
Dress up	To put on elegant clothes
Drop in	To visit someone unexpectedly
Drop off	To deliver someone or something To fall asleep
Drop out	To discontinue one's education
Ease off	To reduce, become less severe or slow down (pain, traffic, work)
End in	To finish in a certain way; result in
End up	To finally reach a state, place or action
Fall through	Something that fails to materialise
Figure out	To comprehend something
Fill out	To fill-up (a form/an application)
Find out	To discover or obtain information
Focus on	To concentrate on something
Get along (with)	To be friendly or comfortable with
Get at	To insinuate
Get away	To run away, escape

Phrasal verb	Meaning
Get by	To subsist or survive
Get in	To enter
Get off	To get down from a bus, train or airplane To remove
Get on	To board a bus, train or plane
Get on with (something)	To continue to do; make progress
Get on (well) with (somebody)	To have a good relationship with
Get out	To leave
Get out of	To avoid doing something
Get over	To recover from (illness, disappointment)
Get over	To recover from (illness, disappointment)
Get rid of	To eliminate
Get together	To meet each other
Get up	To rise, leave bed
Give in	To cease opposition; yield To hand in; submit
Give up	To stop doing something
Go through	To experience

Phrasal verb	Meaning
Grow up	To spend one's childhood; develop; become an adult
Hand in	To submit (report, homework)
Hand out	To distribute
Hang out	To spend time in a particular place or with a group of friends
Hang up	To end a phone conversation
Hold on	To wait To grip tightly
Hurry up	To be quick, act speedily
Iron out	To resolve by discussion, eliminate differences
Join in	To participate
Join up	To engage in, become a member of To meet and unite with
Keep on	To continue doing something
Keep up with	To stay at the same level as someone or something
Kick off	To begin, start
Leave out	To omit, not mention
Let down	To disappoint

Phrasal verb	Meaning
Look after	To take care of
Look down on	To consider as inferior
Look on	To be a spectator at an event
Look for	To try to find something
Look forward to	To await or anticipate with pleasure
Look up to	To admire
Make fun of	To laugh at/ make jokes about
Make up	To invent (excuse, story)
Mix up	To mistake one thing or person for another
Move in	To arrive in a new home or office
Move out	To leave your home/office for another one.
Nod off	To fall asleep
Own up	To admit or confess something
Pass away	To die
Pass out	To faint
Pay back	To reimburse
Put off	To postpone, arrange a later date
Put on	To turn on, switch on

Phrasal verb	Meaning
Put out	To extinguish
Put up	To accommodate, give somebody a bed
Pick up	To collect somebody
Point out	To indicate/direct attention to something
Rely on	To count on, depend on, trust
Rule out	To eliminate
Run away	To escape from a place or suddenly leave
Run into	To meet by accident or unexpectedly (also: bump into)
Run out of	To have no more of something.
Set off	To start a journey;
Set up	To begin a business venture
Shop around	To compare prices of similar things or services
Show off	To indulge in behavior that is designed to gain attention/impress
Show up	To arrive
Shut up (impolite)	To ask someone to stop talking
Sit down	To take a seat

Phrasal verb	Meaning
Stand up	To rise from a sitting position
Stick up for	To defend someone
Take after	To be similar in appearance or character
Take care of	To look after
Take off	To leave
Take on	To recruit/take someone on-board
Take out	To take off; sweep away
Tell off	To scold/reprimand in strong terms
Think over	To reflect on an idea before taking a decision.
Try on	To put on clothing in order to check its fitment
Turn down	To decline
Use up	To completely finish a product (so that there's none left)
Watch out	To warn someone asking them to be careful
Wear out	To become unworthy of being used Extremely tired
Work out	Performing physical exercise To find a solution or calculate something

Phrasal verb	Meaning
Wipe off	To clear away a table or clean a board

Idiomatic usage

Words	Usage Examples
ability to	Your ability to lie has been self-evident at times.
access to	Sam has access to the academic resources available at the research centre.
act as	These E-Retailers act as revenue generators for the postal department.
allows for	Futuristic brain probe allows for wireless control of neurons.
allows to	Children are now allowed to watch almost all TV shows.
as...as	Railways are as crowded as buses.
associate with	I don't like to associate with people such as Tom, Dick or Harry.
a responsibility to	Everyone believes that teachers have a responsibility to inspire.
a result of	Lowered crime rates are a direct result of harsher sentences to criminals.
agree to	After she made a lot of promises, he agreed to go for a movie.

Words	Usage Examples
agree with	I may not agree with what you have to say, but I'll defend to the death your right to say it.
among	<i>Should be used instead of 'between' when discussing more than two items.</i> She was the best athlete among all the six former students.
attend to X	The doctor attended to the inebriated victim.
attribute X to Y	In India, we attribute rainfall to the Gods.
attributed to X	The extinction of the dinosaurs has been attributed to many reasons: the Ice Age, an asteroid collision, etc.
based on	Almost all inferences are based on statistical surveys conducted in the recent past.
begin to	Sam will begin to understand the value of time when it is too late.
believe that	In order to succeed, we must first believe that we can.
believe in	An idea isn't responsible for the people who believe in it.
believe X to be Y	I believe education to be a major cause for poverty.

Words	Usage Examples
between ... and	<i>Only used to discuss two things.</i> Every morning he wakes up and decides between tea and coffee; as if there is any choice!
both ... and	Both fever and cold can be symptoms of other larger problems.
care about	Cars and cameras are important. I don't care about other stuff.
care of	A true friend is the greatest of all blessings, and that which we take the least care of all to acquire.
centers on	The new agenda is too centered on the promotion of business and wealth creation at the expense of everything else.
choose to	Why is he unhappy now? This is the life he chose to live.
comprises	<i>Does not take any preposition.</i> This story comprises many colourful characters.
consistent with	His aspirations are not consistent with the effort he puts in to achieve them.
consists of	This story consists of many colourful characters.

Words	Usage Examples
contend that	I contend that not only can you laugh at adversity, but also face it head on.
consider	<i>Does not take any preposition.</i> This story is considered too violent for children.
contrast X with Y	Contrast chocolates with any other food on the face of the earth today and ask yourself whether chocolates are not the best thing to be found.
convert to	You may convert your brains to slush by watching a lot of TV.
compare X to Y	<i>Used to highlight similarities.</i> It's extremely dangerous and may I add pointless to compare anyone else to Shakespeare.
compare X with Y	<i>Used to highlight differences.</i> Playing sports is a better way to spend your time compared with playing video games.
count on	She is counting on the administrative genius of her friend to win the elections.
concerned with ... than	It is ironical that they are more concerned with schooling than education.

Words	Usage Examples
conform to	In every generation the youth is supposed to conform to the prejudices and the opinions of the old guard.
decide to	<i>Takes a verb.</i> They decided to continue fighting.
decide on	<i>Takes a noun.</i> They also decided on the plans for infiltration of the enemy camp.
depend on	The result of the sports competition now depends on the athletics team.
different from	Number is different from quantity.
difficult to	Success is difficult to define.
distinguish between X and Y	Innovation distinguishes between a leader and a follower.
distinguish X from Y	Every person's life ends the same way. It is only the details of how she lived and how she died that distinguish one person from another.
either ... or	For all meals, it is either rice or roti—how banal!
essential to	They who can give up essential liberty to obtain a little temporary safety deserve neither liberty nor safety.

Words	Usage Examples
except for	An Englishman never enjoys himself, except for when it is for a noble purpose.
expect to	You can expect to do well if you put in the hard work.
grow from	All mighty trunks grow from small seeds.
grow out of	So many people try to grow out of childhood too fast, and it's not fun! You should stay a kid as long as possible!
in order to	I don't build in order to have clients. I have clients in order to build. Read in order to live.
indicate that	I don't understand why the accent you speak in has to indicate what level of intellect you have.
invest in	He has been investing in the real estate market for the past few years.
identical with	Faith is never identical with piety.
in contrast to	A wonderful thing about a book, in contrast to a computer screen, is that you can take it to bed with you.
independent from	I truly believe that women should be financially independent from their men.

Words	Usage Examples
independent to	I am not telling men to step away from speaking for women's rights; rather, I am focusing on women becoming independent enough to fight for themselves.
indifferent towards	People don't care enough. They don't get worked up enough. They don't get angry enough. They don't get passionate enough. I'd rather somebody hate what I do than be indifferent towards it.
leads to	Prosperity often leads to pride, which leads to sin.
leave behind	It is not the honor that you take with you, but the heritage you leave behind.
leave with	If you can come to the Olympic Games and leave with a medal then that is alright.
Like	<i>Used only for direct comparison, to mention a list use 'such as':</i> Always remember that you are absolutely unique. Just like everyone else.
Likely	If you have no critics you'll likely have no success.

Words	Usage Examples
localised in	As you emphasize your life, you must localise and define it... you cannot do everything.
mean by	I've said many times, 'You learn to win through not liking to lose.' And that's what I mean by learning how to win.
mean for	When I say something untrue on the air, I mean for it to be transparently untrue.
mistook ... for	Like all dieters, I mistook eating less for eating well.
modeled after	I went to a business school in Mumbai that is conceptual and interdisciplinary and modeled after Harvard.
more than ever	Investors demand dividends now more than ever.
native to	The alphonso is native to the Konkan region of Maharashtra.
native of	I have been particularly struck with the overwhelming evidence which is given as to the fitness of the natives of India for various offices and employments.
need to	I think we all have a need to know what we do not need to know.

Words	Usage Examples
necessary to	It is not necessary to change. Survival is not mandatory.
neither...nor	Neither a borrower nor a lender be.
not ... but	I describe not men, but manners; not an individual, but a species.
not only...but also	China not only does not support hacking but also opposes it.
prefer to	An industrious sinner I much prefer to a lazy saint.
proceed against	There was enough evidence with the state to proceed against the criminal.
proceed with	In the arts, may you proceed with abandon. In life, may you proceed with balance and stealth.
prohibit from	I was prohibited from working and that was a very interesting period of my life.
potential to	Her remarks had the potential to create a big argument in her family.
range from X to Y	Evidence from mobile devices has provided critical help in solving crimes ranging from homicides to drug trafficking.

Words	Usage Examples
refer to	As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality.
regard as	Exercise should be regarded as a tribute to your body.
require ... to	Teenagers who are never required to vacuum are living in one.
result in	War is a series of catastrophes which result in victory.
rivalry between X and Y	There is no rivalry between films and theatres.
responsible for	You can't be responsible for the way people treat each other.
save for	The less money you owe, the less income you'll need and the less you'll have to save for tomorrow.
save from	Many are saved from sin by being so inept at it.
seem that	It seems that fighting is a game where everybody is the loser.
seem to	Clock watchers never seem to be having a good time.

Words	Usage Examples
so that	I'm whispering so that the media doesn't hear me.
subscribe to	Etiquette does not render you defenceless. If it did, even I wouldn't subscribe to it. But rudeness in retaliation for rudeness just doubles the amount of rudeness in the world.
such as	<i>Use 'such as' to for a list; do not use 'like'.</i> I cannot understate the ability to handle classical texts such as Shakespeare, Faust, etc.
tie to	We are more tied to our faults than to our virtues.
transmit to	I would give no thought of what the world might say of me, if I could only transmit to posterity the reputation of an honest man.

While there is no end to the number of words you can learn, to start with here is a list of 1000 words that will prove to be of assistance while attempting the different questions on the NMAT by GMAC™. Of course, this is not a fool proof list and you will, almost certainly, see words from outside this list on the test. But, as a first step, it is a good idea to start with this list. Once you have learnt these words you can easily learn more words beyond this list.

Remember that consistency is the most important thing when it comes to expanding your vocabulary. We suggest that you start with a small number of words every day—say 20 words or so—and then gradually increase this number. If you progress at the rate of 20 words a day you will have completed all 1000 words in just 50 days!



Important Learning: While learning words, aim for quality and not quantity. If you study words consistently, you will be able to learn a lot of words in relatively less time.

High frequency words:

A

Abase	lower; degrade; humiliate
Abash	make (someone) feel embarrassed, disconcerted or ashamed
Abate	to reduce in amount, degree or intensity; lessen
Abdicate	to relinquish (power or responsibility) formally
Abet	assist, usually in doing something wrong; encourage
Abhorrent	one that is hated; disgusting, loathsome or repellent
Abjure	to renounce, repudiate, retract or give up, usually under oath
Abnegation	renunciation; self-sacrifice
Abominable	detestable; extremely unpleasant
Abortive	unsuccessful; fruitless
Abridge	condense or shorten
Absolve	pardon (an offence)
Abstemious	exercising moderation and self-restraint in appetite and behaviour
Abstruse	difficult to understand; recondite

Abut	to touch at one end or side; lie adjacent
Abyss	an immeasurably deep chasm, depth or void
Accolade	an expression of approval; praise
Acerbic	sour or bitter tasting; acidic
Acme	the highest point, as of achievement or development
Acquiesce	assent; agree passively; comply without protest
Acumen	shrewdness shown by keen insight
Acquit	free from a charge or accusation
Acrimony	bitter ill-natured animosity in speech or behaviour
Adage	wise saying; proverb
Admonish	take to task; to criticise for a fault
Advocate	support or push for something
Aegis	protection; endorsement; guidance
Aesthetic	concerning or characterised by an appreciation of beauty or good taste
Affectation	a deliberate pretense or exaggerated display
Aggress	take the initiative and go on the offensive
Alacrity	liveliness and eagerness

Alleviate	to lessen the pain; to make something better
Altruism	the quality of unselfish concern for the welfare of others
Ambiguous	open to two or more interpretations; of uncertain nature or significance
Ambrosial	worthy of the gods; highly pleasing to the senses—especially that of taste
Ameliorate	to make better
Amenable	disposed or willing to comply
Amnesty	a general pardon granted by a government, especially for political offences
Anachronism	from an incorrect time period
Anarchy	a state of lawlessness and disorder
Anathema	a damnation or a curse
Animadversion	harsh criticism or disapproval
Antediluvian	old; ancient
Antipathy	deep-seated hatred; extreme hostility and dislike
Apathy	lack of interest or concern; indifference
Aphorism	a short pithy instructive saying; an adage
Apocalyptic	prophetic of devastation or ultimate doom

Apogee	final climactic stage; the highest/farthest point
Appall	filled with apprehension or alarm; cause to be unpleasantly surprised
Appellation	a name, title or designation
Apposite	something of striking appropriateness and pertinence
Approbation	official recognition or approval
Arduous	difficult to accomplish; demanding considerable mental effort and skill
Arrogate	seize and take control without authority and possibly with force
Articulate	able to express oneself easily in clear and effective language
Artless	having or displaying no guile, cunning or deceit; innocent
Assiduous	perseverance in carrying out an action; diligent
Assuage	to satisfy or appease; to calm or to pacify
Attenuate	to make slender, fine or small; to lessen the density of; rarefy
Audacious	fearlessly, often recklessly, daring; bold
Austere	severe or stern in disposition or appearance; bare

Autonomous independent in mind or judgment; self-directed

Avarice immoderate desire for wealth; cupidity

Aver to assert formally as a fact; to justify or prove

B

Badger annoy persistently

Baffle frustrate; perplex

Bait food or other lure used to catch fish or trap animals

Balk hesitate; recoil

Balmy mild and pleasant; soothing

Banal repeated too often; familiar through overuse; boring

Bane something causing misery or death

Baleful deadly or sinister

Base contemptible; morally bad; inferior in value or quality

Bask derive or receive pleasure from; get enjoyment from

Bawl cry loudly

Bedlam a state of extreme confusion and disorder

Bedraggle make wet and dirty, as from rain

Befuddle	confuse thoroughly
Begrudge	envy; give or allow unwillingly
Beguile	attract; cause to be enamoured
Behemoth	huge creature; something of monstrous size or power
Belittle	lessen the authority, dignity or reputation of; express a negative opinion
Bellicose	having or showing a ready disposition to fight
Belie	represent falsely
Belligerent	someone who fights or is aggressive
Bellow	shout loudly and without restraint
Bemused	confused; lost in thought; preoccupied
Benediction	the act of praying for divine protection
Benevolent	showing kindness; generous
Benign	kindly; favourable; not malignant
Bequeath	leave or give by will after one's death
Berate	censure severely or angrily
Besmirch	charge falsely; attack the good name and reputation of someone
Blandish	praise somewhat dishonestly
Blasphemy	the act of depriving something of its

sacred character

Boisterous noisy and lacking in restraint or discipline

Bombastic ostentatiously lofty in style

Boorish ill-mannered and coarse; contemptible in behaviour or appearance

Brackish slightly salty

Braggart a very boastful and talkative person

Brusque abrupt and curt in manner or speech

Bucolic descriptive of rural or pastoral life

Burgeon grow and flourish

Buttress a support, usually of stone or brick

C

Cache hiding place, a collection of similar items stored in a hidden or inaccessible place

Cacophony a loud harsh or strident noise

Cajole persuade by praise or false promise; coax; wheedle

Callous hardened; without sympathy for the sufferings of others

Camaraderie goodwill and light-hearted rapport between or among friends

Canard unfounded false rumour; exaggerated false report

Candid	free from prejudice; impartial; frank
Capitulate	to surrender under specified conditions; come to terms
Capricious	characterised by or subject to whims; impulsive and unpredictable
Cardinal	of foremost importance; paramount
Caricature	a representation of a person that is exaggerated for comic effect
Carnage	the savage and excessive killing of many people
Castigation	punishment; chastisement; reproof
Cataclysm	an event resulting in great loss and misfortune; a great flood
Catholic	relating to the Church; comprehensive or universal
Cavalier	casual and offhand; arrogant
Cede	surrender formally
Celerity	speed; rapidity
Censure	harsh criticism or disapproval
Certitude	certainty
Charlatan	a person who makes fraudulent, and often voluble, claims to skill or knowledge
Chasm	a deep opening in the earth's surface; a

	difference of ideas, beliefs or opinions
Chagrin	strong feelings of embarrassment
Chicanery	deception by trickery or sophistry
Choleric	characterised by anger
Circumlocution	an indirect way of expressing something
Citadel	a stronghold into which people could go for shelter during a battle; fortress
Clairvoyant	a person who can look into the future
Coercion	using force to cause something to occur
Cogent	powerfully persuasive
Cognizant	marked by comprehension and perception: fully informed and aware
Collusion	secret agreement or conspiracy
Colossus	a person of exceptional importance and reputation
Comeliness	the quality of being good looking and attractive
Commensurate	corresponding in size, degree or extent; proportional
Commiserate	to feel or express sympathy or compassion
Compendium	a concise but comprehensive summary of a larger work

Complacent	contented to a fault; self-satisfied and unconcerned
Complaisant	showing a cheerful willingness to do favours for others
Concurrent	occurring or operating at the same time
Condone	excuse, overlook or make allowances for; be lenient with
Congéal	to thicken or to solidify
Connoisseur	an expert in some field, especially in the fine arts
Consecrate	render holy by means of religious rites
Consequential	having great significance, following as a result or effect
Contentious	argumentative; quarrelsome; controversial
Conundrum	a difficult problem; a puzzling situation
Convene	call together
Convivial	fun loving; fond of good company
Convolutéd	having numerous overlapping coils or folds
Copious	affording an abundant supply
Cornucopia	the property of being extremely abundant
Corporal	of or relating to the body

Corpulent	excessively fat
Covert	covered over; sheltered; secret
Cower	show submission or fear
Craven	an abject coward
Credulous	believe too readily; gullible
Crestfallen	brought low in spirit; dejected
Cryptic	secret; obscure in meaning
Culmination	a concluding action
Culpable	deserving blame or censure as being wrong or evil
Cursory	hasty and without attention to detail; not thorough
Cynicism	feeling of distrust

D

Dabble	work in an amateurish manner
Dainty	delicate; delicately beautiful
Dandy	a man who is much concerned with his dress and appearance
Dapper	neat in appearance and quick in movements
Dauntless	having or showing courage
Dawdle	loiter; hang around; waste time doing

	nothing
Deadpan	impassive; with no show of feeling; with an expressionless face
Dearth	a scarce supply; a lack
Debacle	a complete failure
Debase	degrade; reduce in quality or value; degenerate
Debauchery	extreme indulgence in sensual pleasures; immoral self-indulgence
Debilitate	weaken (through heat, hunger, illness); enfeeble
Decadence	the state of being degenerate in mental or moral qualities
Decapitate	to cut off the head; behead
Decipher	decode
Decorum	appropriate behaviour; good manners
Decrepit	weak and in bad condition (from old age)
Decry	to condemn openly
Defection	withdrawing support or help despite allegiance
Deference	high degree of respect or courtesy
Defunct	no longer in use, force or operation
Delectable	greatly pleasing, normally associated with

	food; delicious
Deleterious	having a harmful effect; injurious
Deluge	a great flood or a heavy downpour
Demur	to voice opposition; object
Demure	shy
Denigrate	to defame or belittle
Depravity	moral corruption or degradation
Derelict	deserted by an owner or keeper; abandoned; run-down; dilapidated
Derision	the act of deriding or treating with contempt
Descry	to discover by careful observation or scrutiny; detect
Despondent	the condition of being depressed
Detrimental	causing damage or harm; injurious
Diatribes	a bitter, abusive denunciation
Dictum	an authoritative statement
Diffident	lacking self-confidence
Digress	turn aside, especially from the main subject of attention
Dilapidation	a state of deterioration due to old age or long use
Dilatory	wasting time

Dilemma	a confusing situation; a difficult choice
Dilettante	lacking the required professional skill
Dirge	a funeral hymn or lament
Disabuse	free somebody (from an erroneous belief)
Discern	detect with the senses
Disconsolate	sad beyond comforting; incapable of being consoled
Disgruntled	in a state of sulky dissatisfaction
Disparage	to speak of in a slighting or disrespectful way; belittle
Disquietude	feelings of anxiety that make you tense and irritable
Dissemble	to disguise or conceal behind a false appearance
Disseminate	to scatter widely, as in sowing seed
Dissidence	disagreement, especially with the government
Dissuade	discourage someone from a particular course of action
Divulge	reveal a secret
Dogmatic	orthodox; conventional
Dolorous	showing sorrow
Dregs	the sediment in a liquid; the basest or

least desirable portion; residue

Droll arousing laughter

Dulcet pleasing to the ear

E

Ebb recede; lessen; diminish

Ebullience zestful enthusiasm

Eclectic combining elements from a variety of sources

Ecstasy rapture; very strong feeling of joy and happiness

Edifice building (of imposing size)

Effeminate having feminine traits or qualities; characterised by weakness and excessive refinement

Effervescence enthusiasm; vivacity; the process of bubbling as gas escapes

Effete exhausted, infertile or no longer effective; no longer possessing a unique quality

Efficacy power or capacity to produce a desired effect; effectiveness

Effulgence brilliant radiance; bright and sending out rays of light

Egregious bad or offensive; strong and offensive in

	odour or flavour
Egress	a path or opening for going out; an exit
Elated	filled with excited joy and pride; overjoyed
Elegy	a poem or song composed especially as a lament for a deceased person
Elicit	to bring or draw out
Eloquent	persuasive, powerful discourse
Elucidate	explain; make clear; clarify; enlighten
Elusive	evasive; not frank; baffling; hard to grasp, catch or understand
Emaciation	extreme thinness and wasting, caused by disease or undernutrition
Emanate	issue forth; come out
Emancipate	action or process of setting free, especially from legal, social or political restrictions
Embroid	involve in dispute; complicate
Eminent	rising above others; high; lofty; distinguished
Emolument	salary; payment for an office; compensation
Emulate	imitate; rival; try to equal or excel
Encomium	warm, glowing praise

Endemic	prevalent in or peculiar to a particular locality, region or people
Endorse	approve; support
Enervate	to weaken or destroy the strength or vitality
Engender	to procreate; propagate; give rise to
Engross	occupy fully; absorb
Enigmatic	difficult to explain or understand
Enjoin	to give orders to
Ennui	the feeling of being bored by something tedious
Enthrall	hold spellbound
Entice	lure; persuade to do (something wrong); attract; tempt
Entrench	fix firmly or securely
Epiphany	a revelatory manifestation of a divine being
Equanimity	the quality of being calm and even-tempered; maintaining composure
Equivocal	deliberately ambiguous or vague
Erratic	lacking consistency, regularity or uniformity
Erudite	extremely learned

Eschew	to keep away from or to avoid
Esoteric	known by a restricted number of people; understood by few
Eulogy	high praise or commendation
Euphemism	substituting a mild, indirect or vague term for one considered harsh, blunt or offensive
Euphoria	a feeling of great happiness or well-being
Exacerbate	to increase the severity; to aggravate further
Exasperate	to provoke or annoy to an extreme degree
Exhume	to remove from a grave; to dig out of the earth something that has been buried
Exigent	requiring immediate action or remedy; demanding; exacting
Exodus	a departure of a large number of people
Exonerate	to free from blame
Expatriate	to give up residence in one's homeland; to send into exile
Expiate	to make amends; atone
Expurgate	remove parts considered harmful or improper for publication
Extirpate	to destroy totally; exterminate

Extol to pay tribute or homage to; to honour

Exuberant full of unrestrained enthusiasm or joy

F

Fabrication a deliberately false or improbable account

Façade the face or front of a building or a showy misrepresentation intended to conceal something unpleasant

Facile superficial; not deep

Factitious not produced by natural forces

Fallacy a misconception resulting from incorrect reasoning

Falter hesitate; weaken in purpose or action; walk or move unsteadily with weakness

Farce broad comedy; mockery; humorous play full of silly things happening

Fastidious giving careful attention to detail; hard to please; excessively concerned with cleanliness

Fathom comprehend

Fatuous devoid of intelligence

Fawn try to gain favour by cringing or flattering

Feign pretend

Felicity pleasing and appropriate manner or style;

	contentment; joy
Feral	not domestic; wild
Fervent	characterised by intense emotion; extremely hot
Fetid	having a foul smell
Fickle	changeable (in affections or friendship); faithless
Fidelity	the quality of being faithful
Finesse	delicate skill
Flabbergasted	as if struck dumb with astonishment and surprise
Flag	become less intense; lessen
Flagrant	conspicuously and outrageously bad or reprehensible
Fledgling	any new participant in some activity; young and inexperienced
Flout	treat with contemptuous disregard
Fluke	a stroke of luck
Flustered	thrown into a state of agitated confusion
Forage	the act of searching for food and provisions
Formidable	inspiring fear or extremely impressive in strength or excellence

Fortuitous	occurring by chance (positive) rather than intentional
Fractious	likely to be troublesome or easily irritated or annoyed
Fructify	make productive or fruitful
Frugality	prudence in avoiding waste
Frustrate	hinder or prevent (the efforts, plans or desires of)
Furtive	secretive; sly; done with caution and stealth

G

Gainsay	to deny, dispute or contradict; to speak or act against
Gait	a person's manner of walking
Galvanise	to stimulate (someone) into taking action
Gambol	gay or light-hearted recreational activity for diversion or amusement
Gamut	entire range
Gape	open the mouth wide; stare wonderingly with the mouth open
Garbled	not orderly or coherent; lacking continuity
Gargantuan	of great mass; huge and bulky
Garish	over bright in colour; unpleasantly bright;

	gaudy
Garrulous	full of trivial conversation; talkative
Gauche	clumsy (in social behaviour); coarse and uncouth
Gaunt	lean and angular; thin and bony; emaciated
Germane	relevant and appropriate
Gesticulate	motion; gesture
Ghastly	shockingly repellent; inspiring horror
Gibe	mock; make jeering remarks
Giddy	dizzy; causing dizziness
Gingerly	very carefully
Gist	essence; main point; substance
Gloat	express evil satisfaction; look at or think about with evil satisfaction
Gluttonous	given to excess in consumption of especially food or drink
Grandiloquence	high-flown style; excessive use of verbal ornamentation
Gregarious	instinctively or temperamentally seeking and enjoying the company of others
Grouse	complain
Grovel	show submission or fear

Gullible	easily tricked because of being too trusting

H

Hackneyed	repeated too often; overfamiliar through overuse

Hail	frozen rain

Hale	healthy

Hallowed	blessed; consecrated

Harangue	a loud bombastic declamation expressed with strong emotion

Harbinger	something that precedes and indicates the approach of something or someone

Harrowing	agonising; distressing; traumatic

Haughty	proud and arrogant

Headstrong	wilful; stubborn; unyielding

Heckle	verbally harass, as with gibes

Heed	pay attention to

Herald	messenger; sign of something to come; announce; proclaim

Heterodox	characterised by departure from accepted beliefs or standards

Hiatus	an interruption in the intensity or amount of something

Hone	to sharpen; make perfect or complete
Hoodwink	conceal one's true motives by pretending to have good intentions so as to gain an end
Hubris	overbearing pride or presumption
Husband	use cautiously and frugally

I

Iconoclast	someone who attacks cherished ideas or traditional institutions
Idiosyncrasy	a characteristic, habit, mannerism or the like that is peculiar to an individual
Ignominy	a state of dishonour
Illicit	illegal
Illusory	illusive; deceptive; not real
Imminent	close in time; about to occur
Immutable	unchanging
Impair	make worse or less effective or imperfect
Impassioned	filled with passion; fervent
Impassive	having or revealing little emotion or sensibility; not easily aroused or excited
Impeccable	faultless; perfect
Impecunious	not having enough money to pay for necessities

Impede	block or obstruct
Impending	nearing; approaching; about to happen
Impenitent	not penitent or remorseful
Imperious	having or showing arrogant superiority to and disdain of those one views as unworthy
Impertinence	the trait of being rude and inappropriate; inclined to take liberties
Impervious	not admitting of passage or capable of being affected
Impetuous	characterised by undue haste and lack of thought or deliberation
Impetus	incentive; stimulus; momentum
Impiety	without respect for God or religious values
Implacable	incapable of being consoled/calmed
Implausible	highly imaginative but unlikely
Implicate	incriminate; involve incriminatingly; show to be involved (in a crime)
Implicit	understood but not stated; implied
Implore	ask or beg earnestly; beseech
Imponderable	difficult or impossible to evaluate with precision

Impoverish	make poor
Impuissance	powerlessness revealed by an inability to act
Impunity	exemption from punishment or loss
Inadvertent	happening by chance or unexpectedly or unintentionally
Inane	silly; senseless
Incapacitate	permanently injure or in any way made unable to perform an action
Incarcerate	imprison
Incessant	uninterrupted; unceasing
Incinerate	reduced to ashes
Incontrovertible	impossible to deny or disprove
Incorrigible	impossible to correct or reform
Incumbent	currently holding an office or a position of authority
Indiscreet	lacking good judgement; thoughtless
Indolent	disinclined to work or exertion; lazy
Inebriate	become drunk or drink excessively
Inexorable	not to be moved by persuasion; unyielding
Infallible	incapable of failure or error
Infringe	advance beyond the usual limit

Ingenious	showing inventiveness and skill
Ingenuous	inability to mask your feelings, lacking in sophistication or worldliness
Inherent	in the nature of something though not readily apparent
Inimical	not friendly
Innocuous	not injurious to physical or mental health; incapable of causing harm
Inordinate	beyond normal limits
Insidious	working or spreading in a hidden and usually injurious way
Inspid	lacking interest or significance or impact; without flavour or taste
Insular	narrowly restricted in outlook or scope; suggestive of the isolated life of an island
Intangible	incapable of being perceived by the senses, especially the sense of touch
Interment	the ritual placing of a corpse in a grave
Interminable	tiresomely long; seemingly without end
Intractable	difficult to manage or mould or change
Intransigent	impervious to pleas, persuasion, requests or reason
Intrepid	without fear or cannot be intimidated

Intuition	a keen and quick insight; the ability to perceive the truth in something
Inundate	fill or cover completely or beyond normal capacity
Inured	made tough and immune by habitual exposure
Invective	abusive or venomous language used to express blame or bitter deep-seated ill will
Irascible	quickly aroused to anger
Irrepressible	impossible to control or suppress
Irresolute	uncertain how to act or proceed
Itinerary	a proposed route of travel

J

Jabber	chatter rapidly or unintelligibly
Jargon	a characteristic language of a particular group
Jeer	showing your contempt by derision
Jeopardise	pose a threat to; present a danger to
Jest	activity characterised by good humour
Jibe	an insulting remark to someone
Jocose/Jocular	given to (having a tendency of) joking
Jubilant	joyful and proud, especially because of triumph or success

Juxtapose place side by side

K

Kernel central or vital part; core

Kindle call forth (emotions, feelings and responses) or cause to start burning

Kinship a close connection marked by community of interests or similarity in nature or character

Kleptomaniac someone with an irrational urge to steal in the absence of an economic motive

Knack special talent

Knave a deceitful and unreliable scoundrel

Knell tolling of a bell, especially to indicate a funeral, disaster and so on

Knoll little round hill; hillock

Knotty intricate; difficult; tangled

Kudos an expression of approval and commendation

L

Labyrinth complex system of paths or tunnels in which it is easy to get lost

Lachrymose showing sorrow

Lackadaisical	idle or indolent, especially in a dreamy way; lacking spirit or liveliness
Lacklustre	lacking lustre (shine, gloss); dull
Laconic	brief and to the point
Laggard	someone who lags behind
Lament	grieve; express sorrow
Languid	lacking spirit or liveliness
Languish	lose vigour, health or flesh, as through grief; become feeble
Largess	liberality in bestowing gifts; extremely liberal and generous of spirit
Lassitude	weariness; listlessness
Laud	praise, glorify or honour
Lax	careless; negligent; not paying enough attention
Lethargic	deficient in alertness or activity
Levity	a manner lacking seriousness
Libertine	a dissolute person; usually a man who is morally unrestrained
Limpid	crystal clear
Linger	be slow in leaving; delay going
Linguistic	consisting of or related to language
Lionise	treat (a person) as a celebrity

Lissome	moving and bending with ease
Listless	lacking in spirit or energy; languid
Livid	extremely angry
Loath	reluctant; unwilling; disinclined
Loathe	find repugnant
Loquacious	full of trivial conversation
Loutish	ill-mannered and coarse and contemptible in behaviour or appearance
Lucid	transparently clear; easily understandable, transmitting light; able to be seen through with clarity
Lucrative	producing a sizeable profit
Lugubrious	excessively mournful
Luminous	softly bright or radiant
Lurid	glaringly vivid and graphic; marked by sensationalism

M

Magnanimity	liberality in bestowing gifts; extremely liberal and generous of spirit
Maim	mutilate; injure lastingly; disable
Maladroit	not skillful
Malady	illness

Malapropism	the unintentional misuse of a word by confusion with one that sounds similar
Malediction	the act of calling down a curse that invokes evil (and usually serves as an insult)
Malevolent	having or exerting a malignant influence
Malfeasance	wrongful conduct by a public official
Malingering	to pretend illness, especially in order to shirk one's duty, avoid work and so on
Malleable	adaptable; tractable; yielding
Malodorous	having an unpleasant smell
Manifest	evident; visible; obvious
Manipulate	control or play upon (people, forces, etc.) artfully; maneuver
Mar	spoil the appearance of
Martyr	one who suffers for the sake of principle
Masquerade	wear a mask or disguise; pretend
Masticate	chew (food); to bite and grind with the teeth
Maul	handle roughly; batter; injure by beating
Maverick	someone who exhibits great independence in thought and action
Maxim	proverb; truth pithily stated

Mayhem	violent disorder
Meagre	scanty; inadequate
Meander	wind or turn in its course; follow a winding or turning course; move aimlessly and idly
Meddlesome	intrusive; interfering
Medley	mixture
Meek	submissive; patient and long-suffering
Melancholy	gloomy; morose
Melee	a noisy riotous fight
Mellifluous	sounds that are pleasing to the ear
Menace	something that is a source of danger
Mendacity	the tendency to be untruthful
Mendicant	a pauper who lives by begging
Mesmerise	hypnotise
Metamorphosis	change of form
Meticulous	marked by extreme care in treatment of details
Mettle	the courage to carry on
Misanthrope	someone who dislikes people in general
Misconstrue	interpret in the wrong way
Misdemeanor	misbehaviour; misdeed; a crime less serious than a felony

Misnomer	an incorrect or unsuitable name
Misogynist	a misanthrope who dislikes women in particular
Mitigate	make less severe or harsh
Mollify	make less rigid or softer; make more temperate, acceptable or suitable
Mollycoddle	treat with excessive indulgence
Morose	showing a brooding ill humour
Mundane	not ideal or heavenly; found in the ordinary course of events
Munificent	very generous
Myopic	unable to see distant objects clearly; lacking foresight or scope

N

Naive	marked by or showing unaffected simplicity and lack of guile or worldly experience
Nascent	being born or beginning
Natty	marked by up-to-dateness in dress and manners
Nausea	feeling of sickness and desire to vomit
Nebulous	lacking definition or definite content
Necromancy	conjuring up the dead, especially for

	prophesying
Nefarious	extremely wicked
Nemesis	something that brings an end to something; causing misery or death
Neophyte	any new participant in some activity
Nepotism	favouritism (to a relative)
Nettle	cause annoyance in; disturb
Nimble	quick in movement; agile; quick in understanding
Noisome	foul smelling; causing or able to cause nausea
Nonchalant	marked by complete lack of concern
Nonplussed	filled with bewilderment
Nostalgia	longing for the past
Notoriety	disrepute; ill fame
Notoriety	the state of being known for some unfavourable act or quality
Novice	someone new to a field or activity
Noxious	injurious to physical or mental health
Nuance	a subtle difference in meaning or opinion or attitude
Nugatory	of no real value
Numismatics	the collection and study of money (and

coins in particular)

O

Obdurate	stubborn; resistant
Obeisance	the act of obeying; dutiful or submissive behaviour
Obese	excessively fat
Obfuscate	make obscure or unclear
Objurgating	to reproach or denounce vehemently; upbraid harshly; berate sharply
Obliterate	destroy completely; wipe out
Oblivious	inattentive or unmindful; unaware; wholly absorbed
Obnoxious	causes disapproval or harm to something
Obscure	dark; vague; unclear; not well known
Obsequious	attentive in an ingratiating or servile manner
Obsolete	outmoded; no longer used
Obstinate	persist stubbornly
Obstreperous	boisterously and noisily aggressive or defiant
Obtuse	slow to learn or understand; lacking intellect
Obviate	prevent the occurrence of; prevent from

	happening
Occlude	block passage through
Odious	sincerely hated and despised
Olfactory	concerning the sense of smell
Ominous	threatening; of an evil omen
Omnipotent	having unlimited power
Omnipresent	universally present; ubiquitous
Onerous	burdensome, tiring, heavy load that makes one weary
Onus	an onerous or difficult concern
Opprobrium	a state of extreme dishonour and disgrace
Opulence	wealth as exhibited by sumptuous living
Ordain	order by virtue of superior authority; decree
Ordeal	severe trial or affliction; difficult experience
Orthodox	traditional; (of someone) conservative in belief; adhering to an established doctrine
Ossified	set in a rigidly conventional pattern of behaviour, habits or beliefs
Ostentatious	intended to attract notice and impress others

Ostracise	avoid speaking to or dealing with; expel
Overbearing	having or showing arrogant superiority to and disdain of those one views as unworthy
Overt	open and observable; not secret or hidden

P

Pacify	soothe; make calm or quiet; subdue
Paeon	a formal expression of praise
Painstaking	taking pains; showing hard work; taking great care
Palatable	agreeable; pleasing to the taste
Palate	roof of the mouth
Palette	board on which painter mixes pigments
Palindrome	a word or phrase that reads the same backward as forward
Pallid	pale; wan
Palpable	easily perceptible; obvious
Paltry	meagre
Pan	criticise harshly
Panacea	hypothetical remedy for all ills or diseases
Panache	flair; flamboyance

Pandemic	widespread; affecting the majority of people
Pandemonium	wild noisy disorder
Panegyric	a formal expression of praise
Paradox	a statement that contradicts itself
Paragon	a perfect embodiment of a concept
Paramount	foremost in importance; supreme
Paraphernalia	equipment; odds and ends used in a particular activity
Paraphrase	restatement of text in one's own words
Parched	extremely dry; very thirsty
Pare	cut away the outer covering or skin of (with a knife); trim
Parochial	narrowly restricted in outlook or scope
Parry	dodge; circumvent
Parsimonious	excessively unwilling to spend
Partisan	one sided; prejudiced
Passive	inactive
Patent	obvious; easily seen; open for the public to read
Pathogenic	able to cause disease
Pathos	tender sorrow; pity

Patronise	be a regular customer or client of
Paucity	scarcity; dearth
Pauper	very poor person
Peccadillo	slight offence or fault
Pecuniary	pertaining to money
Pedagogue	someone who educates young people
Pedant	a person who pays more attention to formal rules and book learning than they merit
Pedestrian	lacking wit or imagination
Pejorative	having a disparaging, derogatory or belittling effect or force
Pellucid	transparently clear; easily understandable
Penitent	feeling or expressing remorse for misdeeds
Penurious	excessively unwilling to spend
Peremptory	not allowing contradiction or refusal
Perennial	recurring again and again
Perfidy	an act of deliberate betrayal
Perfunctory	hasty and without attention to detail; as a formality only
Pernicious	working or spreading in a hidden and usually injurious way

Peroration	the concluding section of an oration
Perspicacious	having keen mental perception and understanding; acutely insightful and wise
Peruse	examine or consider with attention and in detail
Pervasive	spreading or spread throughout
Philanthropy	donations to charity
Phlegmatic	showing little emotion
Pillage	the act of stealing valuable things from a place
Pillory	to expose to public derision, ridicule or abuse
Pine	have a desire for something or someone
Pique	to arouse an emotion or provoke to action
Pith	the choicest or most essential or most vital part of some idea or experience
Pithy	concise and full of meaning
Pittance	an inadequate payment
Placate	to appease or pacify, especially by concessions or conciliatory gestures
Plagiarise	take without referencing from someone else's writing or speech
Plebiscite	a vote by the electorate determining

	public opinion on a question of national importance
Plethora	extreme or excess
Pluck	courage or resolution in the face of difficulties
Plumb	examine thoroughly and in great depth; exactly
Plummet	drop sharply
Polemic	a controversial argument, as one against some opinion, doctrine and so on
Potion	a medicinal or magical or poisonous beverage
Pragmatic	concerned with practical matters
Prattle	idle or foolish and irrelevant talk
Precursor	something that precedes and indicates the approach of something or someone
Predilection	a predisposition in favour of something
Preen	to be exultant or proud
Preponderant	having superior power and influence
Prescience	the power to foresee the future
Presumptuous	unwarrantedly or impertinently bold
Prevaricate	be deliberately ambiguous or unclear in order to mislead or withhold information

Pristine	immaculately clean and unused
Privation	a state of extreme poverty
Probity	having strong moral principles
Proclivity	a natural inclination
Prodigal	wastefully or recklessly extravagant
Prodigious	so great in size or force or extent as to elicit awe
Profligate	shameless; dissolute; extravagant
Profound	showing intellectual penetration or emotional depth; pervasive or intense; thorough
Profuse	produced or growing in extreme abundance
Proletariat	a social class comprising those who do manual labour or work for wages
Proliferate	cause to grow or increase rapidly
Prolific	productive
Prolix	tediously prolonged or tending to speak or write at great length
Promulgate	put a law into effect by formal declaration; promote an idea or cause
Propound	put forward, as of an idea
Propriety	correct or appropriate behaviour

Prosaic	lacking wit or imagination
Proscribe	command against; prohibit
Proselytise	convert to another faith or religion
Prudence	discretion in practical affairs
Puerile	displaying or suggesting a lack of maturity
Pugilist	someone who fights with his fists for sport
Punctilious	marked by precise accordance with details
Pungent	strong and sharp
Pusillanimous	lacking in courage and manly strength
Putrefy	become putrid; decay with an offensive smell

Q

Quack	medically unqualified
Quaff	to swallow hurriedly or greedily
Quagmire	a soft wet area of low-lying land that sinks underfoot
Qualms	a sudden feeling of apprehensive uneasiness
Quandary	state of uncertainty or perplexity, especially as requiring a choice between equally unfavourable options
Quarantine	isolation to prevent the spread of

	infectious disease
Quarry	animal hunted or caught for food
Quash	put down by force or intimidation
Queasy	causing or fraught with or showing anxiety
Quench	suppress or crush completely; satisfy one's thirst
Querulous	habitually complaining
Quibble	argue over petty things
Quiddity	the quality that makes a thing what it is
Quiescent	being at rest; quiet; still; inactive or motionless
Quirk	a strange attitude or habit
Quisling	a person who betrays his or her own country by aiding an invading enemy
Quiver	a shaky motion
Quixotic	not sensible about practical matters; idealistic and unrealistic
Quorum	a gathering of the minimal number of members of an organisation to conduct business
Quotidian	found in the ordinary course of events; usual or customary

R

Rabble	mob; noisy crowd
Rabid	marked by excessive enthusiasm for and intense devotion to a cause or idea
Racketeer	a person who has dishonest and fraudulent dealings
Raconteur	a person skilled in telling anecdotes
Raffish	marked by a carefree unconventionality or disreputableness
Raffle	lottery
Rail	criticise severely
Rake	immoral or dissolute person
Rally	come or bring together; call up or summon
Ramification	one of the results following from an action or decision
Rampant	growing or spreading uncontrollably; growing in profusion
Ramshackle	in deplorable condition
Rancid	smelling of fermentation or staleness
Rancorous	showing deep-seated resentment
Rank	offensive in odour or flavour
Rankle	irritate; fester; annoy
Ransack	search thoroughly; pillage

Rant	speaking violently or excitedly; rave
Rapacious	devouring or craving food in great quantities
Rapport	close relationship; emotional closeness; harmony
Rapt	engrossed; absorbed; enchanted
Rapture	great joy and delight; ecstasy
Rarefy	make more subtle or refined; become thin
Rave	an extravagantly enthusiastic review
Recalcitrant	marked by stubborn resistance to authority
Recant	to reject or disavow a formerly held belief or opinion
Recondite	difficult to penetrate; incomprehensible to one of ordinary understanding or knowledge
Recuperate	get over an illness or shock
Redoubtable	worthy of respect or honour
Referendum	a legislative act is referred for final approval to a popular vote by the electorate
Relegate	assign to a lower position; reduce in rank
Remiss	failing in what duty requires

Remonstrate	censure severely or angrily
Renascence	a second or new birth
Rendezvous	a meeting planned at a certain time and place
Renegade	fail to fulfill a promise or obligation
Repertoire	the entire range of skills or aptitudes or devices used in a particular field or occupation
Reprehensible	bringing or deserving severe rebuke or censure
Reprisal	a retaliatory action against an enemy in wartime
Repudiate	eject as untrue, unfounded or unjust
Requiem	a song or hymn of mourning composed or performed as a memorial to a dead person
Rescind	cancel officially
Resilience	an occurrence of rebounding or springing back
Restive	being in a tense state
Reticence	hesitation; shyness
Reverent	feeling or showing profound respect or veneration
Rhetoric	study of the technique and rules for using

language effectively

Ribald someone who uses vulgar and offensive language

Risqué suggestive of sexual impropriety

Robust sturdy and strong in form, constitution or construction

Rupture burst

S

Sacerdotal associated with the priesthood or priests

Sacrilege blasphemous behaviour

Sacrosanct must be kept sacred

Sagacious acutely insightful and wise

Salubrious promoting health; healthful

Salutary synonym of salubrious

Salvage rescue (goods or property) from loss

Sanctimonious excessively or hypocritically pious

Sanction the act of final authorisation; restrictions or limitations

Sanguinary marked by eagerness to resort to violence and bloodshed

Sanguine a blood red colour; confidently optimistic and cheerful

Sap	deplete
Sapid	full of flavour
Sardonic	disdainfully or ironically humorous; scornful and mocking
Satiate	fill to satisfaction
Satire	witty language used to convey insults or scorn
Saturnine	sluggish in temperament; gloomy; taciturn
Saunter	a leisurely walk
Savour	enjoy; have a distinctive flavour, smell or quality
Scale	climb up; ascend
Scanty	meagre
Scapegoat	someone who is punished for the errors of others
Schism	division of a group into opposing factions
Scintillate	sparkle; flash; be animated; be full of life
Scion	a descendent or heir
Scoff	laugh (at); mock; ridicule
Scorch	a discolouration caused by heat, sear, burn
Scowl	frown angrily
Scrupulous	arising from a sense of right and wrong;

	principled
Scrutinise	examine closely and critically
Scurrilous	grossly or obscenely abusive
Seasoned	experienced
Secede	withdraw from an organisation or communion
Seclusion	isolation; solitude
Sedate	cause to be calm or quiet as by administering a sedative to
Sedentary	requiring sitting or little activity
Sedition	incitement of discontent or rebellion against a government
Sedulous	marked by care and persistent effort
Seedy	rundown; decrepit; disreputable
Seminal	very important; containing seeds of later development
Senescent	growing old
Sententious	given to excessive moralising
Sepulcher	a chamber that is used as a grave
Serendipity	good luck in making unexpected and fortunate discoveries
Servitude	state of subjection to an owner or master or forced labour imposed as punishment

Sever	cut off from a whole
Shard	a broken piece of a brittle artefact
Silhouette	a drawing of the outline of an object
Simper	to smile in a silly, self-conscious way
Simulate	create a representation or model of
Sinewy	consisting of tendons or resembling a tendon; possessing physical strength and weight; rugged and powerful
Sinister	threatening or foreshadowing evil or tragic developments
Skirmish	a minor short-term fight
Sloth	a disinclination to work or exert yourself
Solicitous	anxious or concerned; eager
Somatic	affecting or characteristic of the body as opposed to the mind or spirit
Sophistry	a false or deceptive argument
Sophomore	a second year undergraduate
Soporific	sleep inducing
Sordid	meanly selfish; dirty; filthy
Specious	plausible but false
Spendthrift	someone who spends money prodigally
Sporadic	recurring in scattered and irregular or unpredictable intervals

Spurious	intended to deceive; fake
Squander	spend extravagantly; waste
Static	showing little if any change; angry criticism
Steep	let sit in a liquid to extract a flavour or to cleanse
Stentorian	very loud or powerful in sound
Stickler	someone who insists on something
Stoic	someone who is seemingly indifferent to emotions
Stolid	having or revealing little emotion or sensibility; not easily aroused or excited
Strut	a proud stiff pompous gait
Stultify	deprive of strength or efficiency; make useless or worthless
Stupefy	make senseless or dizzy by or as if by a blow
Stymie	hinder or prevent the progress
Sublime	lofty or grand
Succinct	expressed in few words; concise
Succulent	full of juice
Suffuse	cause to spread or flush or flood through
Sully	to soil, stain or tarnish

Supercilious	expressive of contempt
Superfluous	more than is needed, desired or required
Supplant	take the place or move into the position of
Supplicate	ask humbly (for something)
Surreptitious	conducted with or marked by hidden aims or methods
Swelter	suffer from intense heat
Sycophant	a person who tries to please someone in order to gain a personal advantage

T

Tacit	implied by or inferred from actions or statements
Taciturn	habitually reserved and uncommunicative
Tawdry	cheap and shoddy
Tedium	dullness owing to length or slowness
Teetotaler	one who abstains from drinking
Temerity	fearless daring
Tempestuous	characterised by violent emotions or behaviour
Tenacity	persistent determination
Tendentious	having or showing a definite tendency, bias or purpose

Tenet	a religious doctrine that is proclaimed as true without proof
Tenuous	lacking substance or significance; thin or slender in form
Tepid	moderately warm; feeling or showing little interest or enthusiasm
Terse	brief and to the point
Tether	tie with a tether
Thrall	the state of being under the control of another person
Throes	violent pangs of suffering
Thwart	hinder or prevent
Timorous	timid by nature or revealing timidity
Tirade	a speech of violent denunciation
Titan	a person of exceptional importance and reputation
Toady	a person who tries to please someone in order to gain a personal advantage
Topography	precise detailed study of the surface features of a region
Torpid	slow and apathetic
Torpor	inactivity resulting from lethargy and lack of vigour or energy

Torque	a twisting force
Tortuous	not straightforward
Tousled	in disarray; extremely disorderly
Tractable	easily managed or controlled
Traduce	speak unfavourably about
Transgression	the action of going beyond or overstepping some boundary or limit
Transient	one who stays for only a short time
Translucent	allowing light to pass through diffusely
Transmute	change in outward structure or looks
Travesty	any grotesque or debased likeness or imitation
Trenchant	incisive or keen; vigorous; clear-cut
Truculent	defiantly aggressive
Truism	an obvious truth
Truncate	make shorter as if by cutting off
Tryst	a secret rendezvous; a date
Tumefy	expand abnormally
Turbid	cloudy; murky
Turpitude	a corrupt or depraved or degenerate act or practice
Tutelage	teaching pupils individually

Tyro someone new to a field or activity

U

Ubiquitous being present everywhere at once

Ulterior being beyond what is seen or avowed;
intentionally kept concealed

Umbrage a feeling of anger caused by being
offended

Unabashed not embarrassed

Unconscionable lacking a conscience

Unctuous characterised by excessive piousness or
moralistic fervour

Undermine to attack by indirect, secret or underhand
means

Underscore give extra weight to

Undulate move in a wavy pattern or with a rising
and falling motion

Unfathomable impossible to understand

Unfeigned not pretended; sincerely felt or expressed

Unflagging unceasing

Unfledged young and inexperienced

Unfrock to deprive (a monk, priest, minister, etc.)
of ecclesiastical rank, authority and
function

Ungainly	lacking grace in movement or posture
Unimpeachable	free of guilt; not subject to blame
Unkempt	not properly maintained or cared for
Unprecedented	having no precedent
Unremitting	not slackening or abating; incessant
Unsavoury	morally offensive
Unseemly	not in keeping with accepted standards of what is right or proper in polite society
Unstinting	very generous
Unsullied	free from blemishes
Untenable	incapable of being defended or justified
Untoward	contrary to your interests or welfare
Unwieldy	difficult to use or handle or manage because of size or weight or shape
Unwitting	not aware or knowing
Upbraid	express criticism towards
Upshot	the final issue, the conclusion or the result
Urbane	sophisticated; polished; refined in manner
Usurp	seize and take control without authority and possibly with force
Usury	the act of lending money at an exorbitant rate of interest

Utilitarian	having a useful function
Utopia	an imaginary place considered to be perfect or ideal
V	
Vacillate	be undecided about something
Vacuous	devoid of matter
Vagary	an unpredictable or erratic action, occurrence, course or instance
Vainglorious	feeling self-important
Valediction	the act of saying farewell
Vanguard	the leading position in any movement or field
Vantage	the quality of having a superior or more favourable position
Vapid	lacking significance, liveliness, spirit or taste
Variegated	having a variety of colours
Venal	capable of being corrupted
Vendetta	any prolonged and bitter feud or rivalry
Venerate	regard with feelings of respect and reverence
Veracity	conformity to truth or fact; accuracy
Verbatim	using exactly the same words

Verbose	using or containing too many words
Verisimilitude	the appearance of truth; the quality of seeming to be true
Vertiginous	having or causing a whirling sensation, liable to falling
Vestige	an indication that something has been present; trace of something that is disappearing
Vex	to irritate; annoy; provoke
Viable	capable of being done
Vicarious	suffered or done by one person as a substitute for another
Vicissitude	a change or variation occurring in the course of something
Vie	compete for something
Vigilant	carefully observant or attentive
Vignette	a brief literary description
Vilify	spread negative information about
Virtuoso	having or revealing supreme mastery or skill
Virulent	infectious; having the ability to cause disease
Viscuous	thick

Vitreous	relating to or resembling or derived from or containing glass
Vitriol	abusive or venomous language
Vituperative	marked by harshly abusive criticism
Vociferous	conspicuously and offensively loud
Volition	the act of making a choice
Voluble	marked by a ready flow of speech
Voluminous	large in number or quantity
Voracious	devouring or craving food in great quantities
Vulnerable	exposed to the possibility of being wounded or hurt

W

Waft	be driven or carried along, as by the air
Wag	move from side to side
Waive	forego; dispense with
Wallow	an indolent or clumsy rolling about; delight greatly in
Wanderlust	very strong or irresistible impulse to travel
Wane	a gradual decline (in size, strength, power or number)
Wastrel	someone who dissipates resources self-indulgently

Waver	the act of moving back and forth
Welter	be immersed in; a confused multitude of things
Wheedle	influence or urge by gentle urging, caressing or flattering
Whet	make keen or more acute; stimulate
Whimsical	determined by chance or impulse or whim rather than by necessity or reason
Whittle	cut small bits or pare shavings from
Wilful	done by design; intentional
Wily	marked by skill in deception
Winnow	blow away or off with a current of air
Winsome	charming in a childlike or naive way
Wizened	lean and wrinkled by shrinkage as from age or illness
Wont	an established custom
Wraith	a visible spirit
Wreck	a serious accident; smash or break forcefully
Writ	a legal document issued by a court or judicial officer
Wry	humorously sarcastic or mocking

X

Xenophobia	a fear of foreigners or strangers
Xenophylic	an attraction to foreign peoples, cultures or customs
Xerothermic	characterised by heat and dryness
Xylophone	a musical instrument

Y

Yearn	have a desire for something
Yeoman	farmer who owns and works his land
Yield	bear, produce or provide
Yoke	a connection, usually between cows on a farm
Yokel	simple-minded country person; bumpkin
Yore	time long past

Z

Zany	ludicrous; foolish
Zealot	a fervent and even militant proponent of something
Zenith	highest point; apex
Zephyr	a slight wind
Zest	great enjoyment or excitement; gusto

Zoology

study of animals

Logical coherence and conceptual fit

Identifying the answer choice that is in consonance with the logical construction of the paragraph is crucial for obtaining a high accuracy level on these questions. One way to do this is to understand the flow of ideas in the sentence, the tone and the structure of the sentence. Certain strategies that can prove helpful in this process are

Use your knowledge of Word 'charge' to narrow down your choices

Words can have a positive charge (a positive meaning), a negative charge (a negative meaning) or a neutral charge (neutral meaning). If you can identify whether your desired answer should have a negative or a positive charge, you can narrow down your choices.

Example 1

The unruly and _____ behaviour exhibited by her children was quite shocking.

For this question we can see that the word which needs to go in the blank should be similar to UNRULY. These are the options given to you:

- (A) Faithful
- (B) Ethical
- (C) Perseverant
- (D) Disobedient
- (E) Depressing

Now, you may not be aware of the exact meaning of UNRULY but you may have heard of it being used somewhere in the negative sense, such as in newspapers. For example, you may remember this headline from a newspaper that you had read sometime in the past 'The police used tear gas to control the unruly mob'. So, then you know that 'unruly' is a negative word, which means you also know that the synonym of 'unruly' will also be a negative word. With this knowledge, you can immediately eliminate options A, B, and C because they are all positive words. So, you now have a 50% chance of getting the answer correct because you have managed to come down to two options.

The correct answer, by the way, is (D) because 'Unruly' means 'disobedient' or 'difficult to control'.



Important Learning: In order to become good at identifying word charge, start reading the newspaper and some current affairs magazines. Even if you won't remember all the words you come across, your subconscious mind will remember whether they carry a positive, negative, or neutral connotation.

Use your knowledge of Word Roots to eliminate options

You would have seen earlier that we broke up the words synonym and antonym into their respective roots to explain their meaning. If you are aware of some common roots, this can at least help you eliminate some of the options.

Example 2

For example, let us say you predict that the word that has to go in the blank should be the antonym of BENIGN. The following options are given to you:

- (A) Syncretism
- (B) Favourable
- (C) Malevolent
- (D) Acrid
- (E) Verbose

Now, even if you do not know the meaning of 'benign' but are aware that its root 'bene' means good (think beneficial, benevolent, etc.), then you immediately know that the antonym will be a negative word signifying harmful or something along those lines.

If you are aware that the root 'mal' means something negative or harmful (think malignant, malnutrition, etc.), then you can immediately select (C) as the correct answer, even if you do not know the meaning of malevolent. At least, you can definitely eliminate option (B), which is more of a synonym of benign. You can also eliminate option (A) because 'syn' means same, and it is extremely unlikely that something with same will mean harmful. So, the knowledge of root words can help you eliminate options or even take you to the correct answer.

Let us consider another example: Let's say that in a particular question you have made the prediction that your answer should be a positive word and you are stuck between the two

words – Malediction and Benediction – both of whose meanings you do not know.

How do you decide which word to go with then?

Word roots can come to your rescue here because you may have heard of words such as malnutrition or malnourishment, which should tell you that 'mal' has a negative connotation. Similarly, you may have heard of words such as beneficial or benevolent, which should tell you that 'bene' has a positive connotation. Thus, if you need to pick the positive word from amongst the two, you should pick 'Benediction' (which means 'blessing').

Identify a relation between some of the options

Example 3

Looking at the bride's refulgent smile, the groom's _____ expression was quite perplexing.

Now, we can predict that the word that has to go in the blank has to be an antonym of REFULGENT. These are the options available to you:

- (A) radiant
- (B) distant
- (C) dull
- (D) glowing
- (E) noisy

Now, most likely you would not know the meaning of REFULGENT. However, you will notice that two of the options—radiant and glowing—are in fact synonyms. Then, there is no way that these two can be your answer because they mean the same thing and you obviously cannot have two answers to the question. Thus, even without knowing the meaning or charge of the word in question, you have managed to eliminate two options.

The correct answer, is (C) because refulgent means shiny or glowing, so dull is the antonym of refulgent.

So, the lesson for you is that you can get to the correct answer even if you don't know the meaning of every given word. However, it definitely helps if you have a good vocabulary so go through the word list given at the end of this

section and try to remember as many of those words as you can.

Let us consider a few more examples:

Directions for examples 4–5: Each of the sentences below consists of one blank or two blanks. Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

Example 4

One requirement of a good book is that it deepens and extend our knowledge, not that it merely _____ what we already know.

- (A) enhance
- (B) confirm
- (C) modify
- (D) reduce
- (E) vilify

Solution

Keyword—deepen and extend our knowledge

Connector—not (contrast)

The word that goes in the blank has to contrast with the keyword

Prediction—reiterate, restate

Confirm comes closest to our prediction and should be the correct answer.

The correct answer is B.

Example 5

There are many things to be said against newspapers, but much of the _____ is _____ when one considers that every now and then they develop a great writer like Don Marquis.

- (A) blandishment; kindled
- (B) somnolence; underscored
- (C) indictment; quashed
- (D) criticism; upheld
- (E) applause; negated

Solution

Keyword—many things to be said against

Connector—but (contrast)

Prediction for Blank 1—criticism, complaint

Prediction for Blank 2—acceptable, worthwhile

Indictment and quashed come closest to our prediction and should be the correct answer.

The correct answer is C.

Plausibility of message (guessing the writer's intention)

The word that goes into the blank should be a logical fit in the sentence, both with respect to the grammar and the author's flow of ideas. One way to do this is to always try to predict the answer before you take a look at the answer choices given to you. This will prevent you from getting confused between similar looking answer choices. Your prediction doesn't have to be very accurate – even something broad like 'the word should be a positive word' or a 'negative word' can be good enough to eliminate some wrong answers.

Let's say you get a fill in the blank question on the test such as this one:

Example 6

Since Indian cricket team is in great form, it will _____ the upcoming cricket World Cup.

- (A) lose
- (B) surrender
- (C) win
- (D) abandon
- (E) wreck

The first thing that you should do is just read the above sentence and not look at the options. After reading the sentence, make a prediction in your head as to what kind of word you think should go in the blank. The word can be anything, it can even be in Hindi. In the above sentence, the logical word has to be 'win' because if the team is in great form, the only logical thing is for it to emerge victorious. Once you have made this prediction, look at the answer choices and go with the one that best matches your prediction, that is (C).

This approach will also help you identify whether your weak area is vocabulary or comprehension. For example, if you notice that you are making the wrong predictions for what you think should be the answer, then you are not understanding the meaning of the sentence correctly. In that case, even if you memorise the entire dictionary, it won't help because your problem is not vocabulary in the first place. Similarly, if you notice that you are making the correct predictions but not getting the answer right, then you need to work at first strengthening your vocabulary base.

Use Keywords and Connectors to make predictions

You have just learnt above that you should always try to predict the correct answer for vocabulary in context questions. In order to be able to make these predictions correctly, try to look for two kinds of clues:

1. The Keywords
2. The Connectors

Keywords are words that tell you the meaning of the word that should go in the blank.

Example 7

For example, consider this sentence:

Known for their bravery, horses are used as symbols of _____ in several cultures.

- (A) arrogance
- (B) courage
- (C) loyalty
- (D) speed
- (E) stamina

As most of you might have guessed, the correct answer should be (B), courage. But why can't the answer be (C), loyalty? Because the sentence talks about horses being known for their 'bravery' i.e. courage, so 'bravery' becomes your keyword in this sentence. Hence, even though horses are also known for loyalty, speed, and stamina, the answer still has to be courage because it is connected to the keyword in the sentence.



Important Learning: Remember that the Keyword does not necessarily have to be a word; it can also be a phrase or a clause.

If 'bravery' were to be replaced with 'devotion' in the original sentence, then what should be the answer?

Known for their devotion, horses are used as symbols of _____ in several cultures.

The answer will then change to 'loyalty', because the Keyword now becomes 'devotion'. This is how Keywords can help you decide which word to go with in the blank, so you must consciously look for the keyword in every sentence that you see.

However, sometimes the Keyword, on its own, may not be enough to convey the entire meaning of the sentence.

Example 8

For example, consider a variation of the above sentence:

Although horses are known for their devotion, in some cultures they are used as symbols of _____.

- (A) arrogance
- (B) courage
- (C) loyalty
- (D) speed
- (E) treachery

The Keyword is still 'devotion' but the meaning of the sentence has reversed because of the use of 'Although'. We call such words Connectors because they help you determine the connection between two parts of a sentence – whether they are connected in the same manner or in a contrasting manner.

In the above example the word that goes into the blank has to contrast with the Keyword 'devotion', so the answer should actually be 'treachery'.

Here is a list of some common 'contrasting' and some 'same-direction' Connectors:

Same Direction Connectors

- Because
- Since
- And
- Hence

- As a result of
- Also
- Due to
- Thus
- Likewise
- Moreover
- Consequently
- Additionally



Important Learning: The ; (semi colon) is also a same direction connector.

Contrasting Connectors

- Despite
- Yet
- But
- However
- Nonetheless
- Nevertheless
- While
- Although
- Ironically
- Rather
- Contrastingly

Note that every sentence may not necessarily have a Connector. In such sentences the meaning, obviously, always goes in the same direction.

Connector Type	Examples
Similar	likewise, in the same way, also, and
Concession / Contrasting	although, but, however, nonetheless, nevertheless
Exemplify	for instance, for example, particularly
Conclusion	therefore, hence, consequently, as a result of, thus
Explanation	so ... that, since, because, due to
Emphasis	in particular, indeed
Contrasting	despite, in spite of, conversely, surprisingly, in contrast, yet, while, rather
More Information	moreover, additionally, furthermore

4.17 Analogies

4.18 What is Measured?

Questions based on analogies aim to measure a candidate's general verbal acumen and insight. These questions are designed to assess a candidate's ability to recognise relationships between ideas, think methodically and exhibit fluency in the English language.

4.19 Overall Test Taking Strategies

1. Identify the link or connection between the given words using a logical and analytical approach.
2. The order of the words in the answer pair should replicate the relationship exhibited by the main pair in the same sequence.
3. There should be no ambiguity in the answer pair.
4. Build competencies in the main types of analogous relationships.
5. Practice extensively.

Analogies

An **analogy** literally means **‘Drawing a comparison in order to show a similarity in some respect’**. An analogy basically uses a relationship between two (or more) elements to show similar relationship among another set of elements. So, these questions **aim to test overall logical understanding of the candidates and how coherently they understand the different kinds of relationships among various elements.**

Types of analogies

There are various types of relationships which are used in analogy-based questions. Below is one such list which shows the various relationships with one example each:

Type	Example	Type	Example	Type	Example
Country & Currency	Japan: Yen	Animal/thing & Sound	Crow: Caw; Rain: Patter	Unit & Part	Pen: Nib; Blade: Fan; Book: Chapter
Instrument & Measurement	Ammeter: Current	Unit & Class	Cup: Crockery	Universal Pair	Chair: Table; Door: Window
Quantity & Unit	Power: Watt	Unit & Home	Cow: Byre	Study & Topic	Cardiology: Heart
Unit & Group	Fish: Shoal	Game & Venue	Skating: Rink; Cricket: Pitch	Word & Extreme	Quarrel: War; Speak: Shout
Animal & Baby	Deer: Fawn	Worker & Tool	Tailor: Needle; Sculptor: Chisel	Word & Synonym	Solicit: Request
Male & Female	Wizard: Witch	Tool & Action	Pen: Action	Word & Antonym	Chaos: Peace
Animal & Movement	Eagle: Swoop	Product & raw material	Oil: Seed; Metal; Ore	Worker & Working place	Actor: Stage; Mechanic: Garage

Let's explore the various types of questions based on Analogy that are asked and the right way to solve them:

Types of questions asked:

1. **Completing analogous pair:** Such questions give the relationship between a pair; along with this, the first element of second pair is given and we have to find the second element based on the relationship similar to the one given by first pair.
2. **Simple Analogy:** In such questions a simple statement is given where a relationship is given and we're asked the second element for the term given in question.
3. **Choosing the analogous pair:** In such questions, a pair is given in the question and we've to find a suitable pair from the options given that resembles the pair given in the question:
4. **Multiple word analogy:** In these questions three elements are given in a pair instead of two and we have to select the suitable option.

Techniques of solving analogy questions

In analogy questions, as tested on the NMAT by GMAC™, you will be given a pair of words in the question stem that will have some relation between them. You need to select a pair of words from the given choices that express the same relation as between the words in the question stem.

1. Trickle: Gush

- (A) Run: Walk
- (B) Rise: Collapse
- (C) Puppy: Dog
- (D) Sip: Gulp
- (E) Room: Window

Keep in mind that in an analogy question, there will always be some connection between the words given to you in the question stem. The first step is to identify that link or connection; let's call this making a bridge. Once you have made this bridge, plug your answer choices into this bridge and identify the answer choice for which this bridge holds true. That is your answer.

So, in the above question, trickle means to fall slowly, whereas gush means to fall rapidly. Thus, the bridge between the two words can be *to gush is to trickle quickly*.

Now, let's try to plug in our answer choices in this bridge.

- (A) To walk is to run quickly? No. In fact, the opposite is true. *Remember that since you have made your original bridge starting with the second word (gush), you should do the same while plugging the answer choices into this*

bridge. So, you need to start with the second word 'walk' and not with the first word 'run'.

- (B) To *collapse* is to *rise* quickly? Absolutely not. These are, in fact, antonyms.
- (C) To *dog* is to *puppy* quickly? Makes no sense.
- (D) To *gulp* is to *sip* quickly? Yes! This option matches our original bridge perfectly and should be the correct answer.
- (E) To *window* is to *room* quickly? Makes no sense.

The correct answer is (D).



Important Learning: Make sure you plug into the answer choices in the same order as in the original bridge. So, if you have started with the second word in the original bridge, start with the second word while plugging in the answer choices and vice versa.

Now, let us attempt different questions exhibiting the various analogous relationships.

Antonym/synonym and related relationships

One way in which analogies are expressed is by using synonyms (words that convey similar meanings or ideas) or antonyms (words that convey diametrically opposite ideas or states). For example, Life – death, happiness – sadness, brave – timid and so on.

Example 1

Praise : Criticise

- (A) Stroll : Walk
- (B) Noxious : Poisonous
- (C) Tedious : Monotonous
- (D) Felicitate : Taunt
- (E) Resilient : Durable

Solution

Here is the bridge between the words in the question stem—praise and criticise are antonyms.

Plugging this bridge in the answer choices, we get

- (A) To **stroll** is to **walk** in a leisurely manner—Incorrect
- (B) **Noxious** refers to something that is harmful or **poisonous**—Incorrect
- (C) **Tedious** refers to something that is too slow or **monotonous**—Incorrect
- (D) **Felicitate** means to congratulate someone whereas **taunt** refers to remarks that are meant to provoke or hurt someone—**Correct**
- (E) **Resilient** refers to something that is tough, sturdy and **durable**—Incorrect

The correct answer is D.

Part to whole, general to specific

These analogies establish a relation between an object and the group it belongs to. It essentially contains the part, or section of something larger and the whole, or the entire entity. For example, branch-tree, arm-man, page-book and so on.

Example 2

Eulogy : Praise

- (A) Rant : Fear
- (B) Heretic : Convention
- (C) Lambast : Redeem
- (D) Elegy : Lament
- (E) Catastrophe : Trauma

Solution

Here is the bridge between the words in the question stem—a **eulogy** always contains **praise**.

Plugging this bridge in the answer choices, we get

- (A) A **rant** always contains **fear**—Incorrect
- (B) A **heretic** always contains **convention**—Incorrect
- (C) A **lambast** always contains **redeem**—Incorrect
- (D) An **elegy** always contains **lament**—**Correct**
- (E) A **catastrophe** always contains **trauma**—Not necessarily

The correct answer is D.

Difference of degree

Certain analogies compare similar things of different degrees. They show the greater/lesser extent or intensity of something. For example, cool-freezing, warm-burning, fear-phobia, upset-hysterical and so on.

Example 3

Joy : Euphoria

- (A) Misery : Sorrow
- (B) Triumph : Ecstasy
- (C) Write : Type
- (D) Punish : Scold
- (E) Anger : Wrath

Solution

Here is the bridge between the words in the question stem—**euphoria** is a higher degree of **joy** (note that we are starting with the second word).

Plugging this bridge in the answer choices, we get:

- (A) Sorrow is a higher degree of **misery**—Incorrect (Sorrow is the same as misery.)
- (B) Ecstasy is a higher degree of **triumph**—Incorrect
- (C) Type is a higher degree of **write**—Incorrect
- (D) Scold is a higher degree of **punish**—Incorrect (They are almost the same thing.)
- (E) Wrath is a higher degree of **anger**—Correct

The correct answer is E.

Performer to object or action

These analogies present a relationship between a person or an animal and an action associated with them. For example, author-write, chef-cook, plumber-pipe, cashier-cash and so on.

Example 4

Critic : Fault

- (A) Artist : Praise
- (B) Amateur : Persevere
- (C) Athlete : Practice
- (D) Arbitrator : Mediate
- (E) Thief : Arrest

Solution

Here is the bridge between the words in the question stem—the work of a **critic** is to (find) **fault**.

Plugging this bridge in the answer choices, we get

- (A) The work of an **artist** is to **praise**—Incorrect
- (B) The work of an **amateur** is to **persevere**—Incorrect
- (C) The work of an **athlete** is to **practice**—Incorrect (This is not the ‘**work**’ of an athlete. The work of an athlete would be to compete.)
- (D) The work of an **arbitrator** is to **mediate**—**Correct**
- (E) The work of a **thief** is to **arrest**—Incorrect

The correct answer is D.

Defining or typical characteristics

These analogies establish a relation between a noun and a description that is generally believed to be true of that noun. In other words, they present the defining trait or characteristic of a person, animal or object. For example, fish-slippery, giraffe-tall, pillow-soft and so on.

Example 5

Acrobat : Agility

- (A) Engineer : Clarity
- (B) Student : Perseverance
- (C) Surgeon : Dexterity
- (D) Entrepreneur : Capital
- (E) Lawyer : Courtroom

Solution

Here is the bridge between the words in the question stem—an **acrobat** requires **agility** ('agility' means flexibility).

Plugging this bridge in the answer choices, we get:

- (A) An **engineer** requires **clarity**—Incorrect
- (B) A **student** requires **perseverance**—Incorrect
- (C) A **surgeon** requires **dexterity**—**Correct**
- (D) An entrepreneur requires capital—Not necessarily
(There are businesses that can be started with little or no capital.)
- (E) A lawyer requires a courtroom—Not necessarily

The correct answer is C.

Cause and effect

This analogy establishes a causal relationship between the two terms – one is the effect of the other. For example, thirst – water, accident – injury, fire – burn and so on.

Example 6

Pain : Writhe

- (A) Anger : Seethe
- (B) Joy : Envy
- (C) Stress : Monotony
- (D) Courage : Fear
- (E) Verity : Specious

Solution

Here is the bridge between the words in the question stem—pain causes one to writhe (respond with emotional and physical discomfort).

Plugging this bridge in the answer choices, we get

- (A) **Anger** causes a person to **seethe**—Correct
- (B) **Joy** causes one to **envy**—Incorrect
- (C) **Stress** causes one to **monotony**—Incorrect
- (D) **Courage** causes one to **fear**—Incorrect
- (E) **Verity** causes one to **speciousness**—Incorrect

The correct answer is A.

Thus, the key in any analogy question in NMAT by GMAC™ is to make the original bridge correctly.

5.0 Language Skills Practice

5.1 Practice Questions

1 Reading Comprehension

Each of the reading comprehension questions is based on the content of a passage. After reading the passage, answer all questions pertaining to it on the basis of what is stated or implied in the passage. For each question, select the best answer from the given choices.

Passage 1 **(Real NMAT Question)**

Advertising communicates the firm's employment needs to the public through media such as newspapers, radio, television and industry publications. The internet is the newest and fastest growing external recruitment method. Regardless of the advertising method utilised in determining the content of an advertising message, a firm must decide on the corporate image it wants to project. Obviously, the firm should give prospective employees an accurate picture of the job and the organisation.

The firm's previous experience with various media should suggest the most effective approach for specific types of jobs. A common form of advertising that provides broad coverage at a relatively low cost is the newspaper advertisement. Such advertisements generate a vast number of candidates most of whom aren't qualified, and these inquiries are costly to process. This situation increases the likelihood of poor selection decisions. At the same time, the firm should attempt to appeal to the self-interest of prospective employees, emphasising the job's unique qualities. The ad must tell potential employees why they should be interested in that particular job and organisation. The message should also indicate how an applicant is to respond—apply in person, apply by telephone or submit a resume by fax or e-mail.

Although few individuals base their decisions to change jobs on advertising, an ad creates awareness, generates interest and encourages a prospect to seek more information about the firm and the job opportunities that it provides. Examination of the Sunday edition of any major newspaper reveals the extensive use of newspaper advertising in recruiting.

Advertising in Professional and Trade Journals: Certain media attract an audience that is more homogeneous in terms of employment skills, education and orientation. Advertisements placed in such publications as the *Wall Street Journal* relate primarily to managerial,

professional and technical positions. The readers of these publications are generally individuals qualified for many of the positions advertised. Focusing on a specific labour market minimises the likelihood of receiving marginally qualified or even totally unqualified applicants.

Virtually every professional group publishes a journal that is widely read by its members. Advertising for a marketing executive position in *Marketing Forum*, for example, would hit the target market because marketing professionals are virtually the exclusive readers. Trade journals are also widely utilised. However, using journals does present problems. For example, they lack scheduling flexibility; their publishing deadlines may be weeks prior to the issue. Because firms cannot always anticipate staffing far in advance, journals have obvious limitations for recruitment.

1. What is the central idea of the passage?
 - (A) That jobs are primarily advertised through newspapers and employment journals.
 - (B) The various aspects of the job that should be kept in mind both as the advertiser and as the respondent to the advertisement.
 - (C) That there is a difference between trade journals and newspapers regarding employment opportunities.
 - (D) That job advertisements occupy an important place in newspapers and employment journals of companies.
 - (E) That using a variety of advertising platforms like newspapers and journals to communicate employment opportunities can determine a better outcome.
2. Although newspaper ads are a reliable source of job recruitments, there are risks involved. This is because:
 - (A) these days, there are other sources for finding job vacancies as well.

- (B) the self-interest of the employees is not catered to in a proper manner.
- (C) at times, the image of the company that is recruiting new candidates is not projected well.
- (D) though the ads are low cost, the coverage is broader so the chances of making a good selection are rare.
- (E) there are enhanced chances of poor selection as the vast majority that apply are unsuitable for the vacant seat.

3. What is the tone of the author in the passage?

- (A) Critical
- (B) Laudatory
- (C) Analytical
- (D) Argumentative
- (E) Cynical

4. According to the passage, the author most likely agrees with all of the following statements EXCEPT:

- (A) the use of journals for recruitments has its own limitations.
- (B) media offers a wide variety of recruitment services these days.
- (C) newspaper ads are no longer in demand for job recruitments.
- (D) newspaper ads often generate a large number of unsuitable candidates.
- (E) advertising is rarely the basis for an employee's decision to change jobs.

Passage 2 *(Real NMAT Question)*

According to Wimsatt and Beardsley, even though the influence of the author's 'intention' upon the critic's opinion has been disputed in a number of discussions, it is doubtful whether most of its 'romantic corollaries' are widely subject to questioning. The author duo finds the design or intention of the author neither accessible nor desirable as a yardstick for judging the accomplishment of a literary text. They define 'intention' as "design or plan in the author's mind. Intention has obvious affinities for the author's attitude toward his work, the way he felt, what made him write."

Even though a text comes into existence only through the medium of an author, it is erroneous to assign the author's design to the status of a standard by which critics are to evaluate the text. Besides, the question arises as to how a critic is to find out the 'intention' behind a text. Wimsatt and Beardsley believe that if the poet was successful in bringing out his intention through the words he had written, it must be evident in the poem itself. And if the poet was not successful in doing so, the critic must move outside the text to search for the intention. Unlike practical messages, which are successful only if the readers correctly infer the intention of the author, poems should just be, not mean.

Another argument that the duo puts forward is regarding the process of revision. Authors often revise their work, thereby creating multiple versions of the same text. This raises the question of which intention is to be considered by the critics. By extension, it raises the question of whether the author's "former concrete intention was not his intention".

Wimsatt and Beardsley conclude that a text is neither the critic's nor the author's. It is detached from the author at birth and goes about the world beyond his power of intention or ability to control it. The poem belongs to the public. It comes to life through language, which

is the peculiar possession of the public and it is about the human being, which is an object of public knowledge.

1. The passage is primarily concerned with:
 - (A) an evaluator's paradigm for evaluation.
 - (B) the worth of the objective at the source.
 - (C) public knowledge regarding a literary text.
 - (D) the significance of Wimsatt and Beardsley's ideas.
 - (E) the question regarding the revision of literary texts.
2. The author mentions all of the following EXCEPT:
 - (A) the work of the author belongs to the public.
 - (B) language gives life to a piece of literary work.
 - (C) critics consign meaning to books and poems.
 - (D) no one has ever questioned the intention of the poet.
 - (E) practical passages require an understanding of the author's intention.
3. According to the passage, the author most likely agrees with all of the following statements EXCEPT:
 - (A) the intention of the author is redundant.
 - (B) a text is never for the author to call his own.
 - (C) the author's intention must always be preserved.
 - (D) the author's attitude towards his work is set in stone.
 - (E) authors often revise their work creating multiple versions of the text.
4. What is meant by the statement that "The poem belongs to the public"?
 - (A) The author writes only for the public.
 - (B) Critics can never influence the public's ideas.

- (C) The public assigns meaning to a work of literature.
- (D) Literature can be possessed only by the public.
- (E) Authors and critics are outside the public domain.

Passage 3 *(Real NMAT Question)*

A clutch of new studies in the field of the psychology of emotion offer opportunities for humans to have better control over their emotions. Unfortunately, some other research has proven conclusively that certain emotions that are triggered spontaneously, most notable among them being anger, are often accompanied by the release of various types of chemicals and hormones. These chemicals and hormones, interestingly, help to further sustain the emotional outburst. To take an example, anger causes the release of adrenaline, and this adrenaline further helps to sustain, and even magnify, that aroused state of anger. To make matters worse, the rate of dissipation of this adrenaline is not within the control of the conscious human mind. Hence, when such emotions get triggered, they tend to circumvent our conscious mind, a fact that has several vital implications for emotional impulse control.

The solution then is to somehow be able to avoid setting off such impulses that are beyond the control of our conscious mind, something that is easier said than done. One way of doing so is to get a better understanding of how we perceive different events around us. The idea is to view everything with an objective mindset and avoid the ‘jumping to conclusions’ syndrome, which can trigger these unwanted impulses. To illustrate, it is possible for two people to view the same event but reach entirely different conclusions about its connotation. Let’s say if we see a group of people pointing in our direction and laughing, many of us will misconstrue such an act, thinking that those people are laughing at us and become irritated or angry. Such a reaction could then trigger the adrenaline-fuelled anger, and we could even end up getting into a fight with those people. However, a smarter, and less impulsive, approach could be to simply view the event for what it is—a group of people pointing at something and laughing. For all we know, they could be pointing at something behind us. Such people will not jump to conclusions; rather, they will wait for more clarity on the actions of those people

before coming up with a reaction. Remember that even though we cannot control the action of those people, we can always control our reaction to their actions, by addressing them calmly or even simply ignoring them.

1. Which of the following is definitely true, according to the author?
 - (A) The rate of dissipation of certain hormones is only within the control of the sub-conscious human mind.
 - (B) It is better to control our anger.
 - (C) Physical reactions are always interconnected with hormones.
 - (D) Certain emotions are the result of a calculated approach to situations.
 - (E) Our conscious mind is responsible for our emotions.
2. According to the passage, a rational person differs from a highly impulsive person in that:
 - (A) a rational person's body produces a controllable amount of hormones.
 - (B) a rational person is able to better control his judgment of events.
 - (C) a rational person does not let his hormones affect his emotions.
 - (D) a rational person does not allow emotions to bypass his conscious mind.
 - (E) a rational person has no less a tendency to jump to conclusions.
3. What is the meaning of the word 'misconstrue' as used in the passage (paragraph two)?
 - (A) Mislead

- (B) Misdemeanor
- (C) Misguide
- (D) Misinterpret
- (E) Misrepresent

4. Why does the author use the term '**unfortunately**' in the second sentence of the passage?

- (A) To underscore the inherent sorrow that a person who is unable to contain his emotions, faces.
- (B) To provide a contrast with the previous sentence by stating that in some cases a person may not be able to voluntarily control his emotions in the first place.
- (C) To assert that a person not being able to contain his emotions is not the desired state of affairs.
- (D) To conclude that all the efforts of researchers have gone in vain because there is actually a connection between hormones and emotions.
- (E) To arrive at a conclusion about the relationship between hormones and emotions later in the passage.

Passage 4 **(Real NMAT Question)**

Once a charitable foundation bestows a grant of money to a chosen recipient, or “beneficiary,” the foundation’s main defence against misuse/waste of its grant is the individual contractual agreement between foundation and beneficiary. These contracts tend to be idiosyncratic, varying with the specific purposes of the foundation and the grant; thus, they have not been the focus of much academic study. However, scholars have identified informal non-contractual control mechanisms by which foundations guard against misuse of their investment. Such mechanisms arise at three points: in the initial screening of projects, in the decision of how much funding to allocate, and in the contract between the foundation and the beneficiary.

Needless to say, a foundation’s power over its beneficiaries’ activities is greatest before it has committed money to them. Foundations can best protect against unsatisfactory use of their grants by awarding grants only to beneficiaries which intend to use the money for projects which the foundation encourages. Screening may be done in two ways. First, foundations can issue public statements on types of programme they will—or will not—fund. This will prevent mistaken misuse by recipients, though not fraudulent abuse. Foundations may issue absolute (negative) prohibitions; for example, a clause that no money will be given for personal charity or religious education. Alternately, they may affirmatively announce types of projects that they will *fund*.

Second, foundations can take a proactive role, by working with promising applicants to propose new projects or define the goals/parameters of existing ones. A foundation exercises considerable power through its grasp of the purse strings and the manner in which it doles out its grant. Most fundamentally, a foundation can specify what type of expenses it will, or will not, reimburse. Furthermore, foundations can grant themselves more

discretion, and retain more of their bargaining power with beneficiaries, by disbursing only part of the total projected cost at regular intervals. This allows them to monitor a project to ensure it has not strayed from the desired parameters, and it also encourages beneficiaries to meet deadlines and disclose results.

Once the foundation has disbursed some or all of its funding and the beneficiary's project is underway, the foundation may want to continue monitoring progress to prevent misuse of funds or unwanted deviations from the originally-planned project. This supervision can be accomplished through several methods. The foundation can specify in its agreement with the beneficiary that its grant is a *conditional grant*, contingent on specified uses. An alternate approach is for the foundation to appoint monitors to work with the beneficiary throughout the project. This is a common practice for venture capital "foundations" in monitoring the start-up companies which are the beneficiaries of their seed capital.

1. What is the primary purpose of the passage?
 - (A) To describe why it is imperative for charitable foundations to keep a track of the activities of the beneficiaries they have funded.
 - (B) To argue for the creation of more standardised contracts between charitable foundations and their beneficiaries.
 - (C) To explain and support the proactive role certain charitable organisations play in the activities of their beneficiaries.
 - (D) To discuss the different ways in which charitable foundations can control the misuse of their funds by the beneficiaries.
 - (E) To provide an explanation for the seemingly overbearing behaviour of charitable organisations towards their beneficiaries.

2. According to the passage, each of the following is a method used by charitable foundations to control the use of their funds EXCEPT:
- (A) making the grant of funds dependent on the fulfillment of certain obligations and deliverables on the part of the beneficiary.
 - (B) explicitly detailing the types of expenditure that they will reimburse or not reimburse.
 - (C) prohibiting certain types of beneficiaries from applying for their funds.
 - (D) acting as mentors to their beneficiaries and guiding them in making appropriate use of the funds.
 - (E) giving out the total amount of the grant in a staggered manner.
3. According to the various criteria mentioned in the passage, which of the following entities will most probably be funded by a charitable organisation?
- (A) An entity which takes an advance payment on expenses to be made and doesn't share its details thereafter.
 - (B) An entity that plans to undertake an activity prohibited by the charitable organisation.
 - (C) An entity that requires the entire amount of the grant to be paid upfront.
 - (D) An entity which is determined to appoint the monitors themselves.
 - (E) An entity that refuses to follow the subsequent additional instructions of the charitable organisation arising over the course of its operations.
4. What is the meaning of the term 'discretion' as used in the 3rd paragraph of the passage?

- (A) Secrecy
- (B) Responsibility
- (C) Authority
- (D) Credibility
- (E) Gullibility

Passage 5 *(Real NMAT Question)*

The biggest house of cards, the longest tongue and, of course, the tallest man—these are among the thousands of records logged in the famous *Guinness Book of Records*. Created in 1955 after a debate concerning Europe's fastest game bird, what began as a marketing tool sold to pub landlords to promote Guinness, an Irish drink, became the bestselling copyright title of all time (a category that excludes books such as the Bible and the Koran). In time, the book would sell 120 million copies in over 100 countries—quite a leap from its humble beginnings.

In its early years, the book set its sights on satisfying man's innate curiosity about the natural world around him. Its two principal fact finders, twins Norris and Ross McWhirter, scoured the globe to collect empirical facts. It was their task to find and document aspects of life that can be sensed or observed, things that can be quantified or measured—but not just any things. They were only interested in superlatives: the biggest and the best.

In its latest incarnation, the book has found a new home on the Internet. No longer restricted to the confines of physical paper, the *Guinness World Records* website contains seemingly innumerable facts concerning such topics as the most powerful combustion engine or the world's longest train. What is striking, however, is that such facts are found sharing a page with the record of the heaviest train to be pulled with a beard. While there is no denying that each of these facts has its own individual allure, the latter represents a significant deviation from the education-oriented facts of earlier editions. Perhaps, there is useful knowledge to be gleaned regarding the tensile strength of a beard, but this seems to cater to an audience more interested in seeking entertainment than education.

Originating as a simple bar book, the *Guinness Book of Records* has evolved over decades to provide insight into the full spectrum of modern life. And although one may be more likely now to learn about

the widest human mouth than the highest number of casualties in a single battle of the Civil War, the *Guinness World Records* website offers a telling glimpse into the future of fact finding and record recording.

1. What is the main purpose of the author in writing the passage?
 - (A) To discuss the origins of the *Guinness Book* and its evolution over the years.
 - (B) To criticise the fact that the *Guinness Book*, in its current form, stresses more on entertainment than on education.
 - (C) To explain the origin of the *Guinness Book*.
 - (D) To analyse what makes the *Guinness Book* the largest selling book in the world.
 - (E) To discuss how the *Guinness Book* originated and to advocate against the commercialisation of the book in its current form.
2. Which of the following is mentioned in the passage as a record contained in the *Guinness Book*?
 - (A) The world's largest combustion engine.
 - (B) The world's longest train.
 - (C) The world's heaviest train.
 - (D) The world's widest mouth.
 - (E) The world's strongest beard.
3. According to the author, how is the current version of the *Guinness Book* different from its older versions in terms of content?
 - (A) The book is now available on the Internet.

- (B) The book now contains entertainment-oriented facts along with educational ones.
 - (C) The book now offers insight into the full spectrum of life.
 - (D) The focus of the book has shifted from providing education to providing entertainment.
 - (E) The *Guinness Book* offers a telling glimpse into the future of fact finding and record recording.
4. Which of the following words is closest in meaning to the word incarnation as used in the passage?
- (A) Embodiment
 - (B) Incorporeal
 - (C) Ability
 - (D) Computerised
 - (E) Epitome

Passage 6 *(Real NMAT Question)*

Tycho Brahe, a famous sixteenth century astronomer, is well-known for his contributions to modernising astronomy. He designed, built and continuously calibrated astronomical instruments with periodic checks on their accuracy. Tycho transformed astronomical instrumentation and observational practices in astronomy.

One of the reasons why Tycho went on to revolutionise astronomy was that he understood the importance of accuracy in astronomy and his pursuit of it. Where earlier astronomers were content in observing the positions of the planets and the Moon only at certain important points in their paths, Tycho, along with his assistants, observed these heavenly bodies throughout their orbits. Consequently, Tycho discovered orbital anomalies, which were previously unknown. These anomalies would later help Kepler, Tycho's assistant, to discover that planets moved in elliptical orbits.

Tycho discovered a new star, Cassiopeia, in 1572. The publication of his observations in his book *De Nova Stella* in 1573 catapulted him to the class of great astronomers. Additionally, Tycho discovered a comet in 1577. On measuring the distance or parallax of the comet, Tycho was able to prove that the comet was further away than the Moon. This refuted the Aristotelian belief that comets were 'gases burning in the atmosphere'. His observations were instrumental in instituting the fact that heavenly bodies like the stars and comets were above the Moon and thus, heavens were not immutable, contrary to Aristotle's beliefs. This directly questioned Aristotelian division between heavenly and earthly regions.

Furthermore, if comets were believed to exist in heaven, then they would have needed to move through heaven. The prevalent belief at the time was that planets were seated on spherical shells that fitted tightly around each other. Tycho illustrated the implausibility of this arrangement as he showed comets to move through these spheres.

This led to fading out of the existence of celestial spheres between 1575 and 1625.

However, Tycho could not ignore Aristotelian physics, which was founded on the 'absolute' notion of place— heavy bodies 'fall' to their 'natural place', and, based on this, the Earth, was the centre of the universe. Had this not been the case, the basic foundations and principles of physics at the time, would have been severely challenged. Tycho, to some measure, also supported the heliocentric planetary arrangement proposed in 1543 by another great astronomer, Nicholas Copernicus. Instead of adopting either of the two theories, Tycho devised his own theory using the best of both theories. According to Aristotelian physics, Tycho retained the Earth as the centre of the universe. The Moon and Sun revolved around the Earth, whereas Mercury, Venus, Mars, Jupiter and Saturn revolved around the Sun. The shell of the fixed stars was centred on the Earth. However, he put the circular path of the comet he discovered in 1577 between Venus and Mars.

This Tychonic world system became popular early in the seventeenth century. This system provided a middle ground between the Ptolemaic models and Copernican models. Thus, Tycho's quality of the observations themselves was central to the development of modern astronomy.

1. What is the central idea of this passage?
 - (A) The Tychonic system was a trailblazer that is in use even today.
 - (B) Tycho's extensive use of Aristotelian physics endorsed his belief in Aristotle.
 - (C) Tycho's discoveries paved the way for the development of modern astronomy.
 - (D) Celestial spheres are still in existence today and dictate the course of astronomy.

- (E) Tycho's discoveries were instrumental in understanding how paths of planets and comets crossed.
2. Which of the following, if true, would weaken the argument presented in the text?
- (A) Aristotelian physics played a part in Tycho's discoveries.
 - (B) Astronomy was an active discipline in the sixteenth century.
 - (C) Tycho was able to garner only limited fame discovering the star, Cassiopeia.
 - (D) The Ptolemaic system was more accepted than the rejected Copernican model.
 - (E) Tycho accidentally discovered that the spheres on which planets rested had gaps.
3. The author mentions all of the following EXCEPT:
- (A) Kepler's discovery of elliptical planetary orbits.
 - (B) Tycho's other assistants and their achievements.
 - (C) Tycho modernised astronomical instrumentation.
 - (D) Tycho's work endorsed the Aristotelian definition of comets.
 - (E) Tycho's discovery of the shell of fixed stars was centred on the Earth.
4. Based on the passage, what can be concluded about the author's tone when writing about Tycho Brahe?
- (A) It is cynical.
 - (B) It is mocking.
 - (C) It is supportive.
 - (D) It is ambivalent.
 - (E) It is pessimistic.

Passage 7 *(Real NMAT Question)*

Criminal identification by means of fingerprints is one of the most potent factors in obtaining the apprehension of fugitives who might otherwise escape arrest and continue their criminal activities indefinitely. This type of identification also makes possible an accurate determination of the number of previous arrests and convictions, which of course results in the imposition of more equitable sentences by the judiciary, in as much as the individual who repeatedly violates the law finds it impossible to pose successfully as a first or minor offender. In addition, this system of identification enables the prosecutor to present his case in the light of the offender's previous record. It also provides the probation officers, parole board and the governor with definite information upon which to base their judgement in dealing with criminals in their jurisdictions.

From earliest times, fingerprinting, because of its peculiar adaptability to the field, has been associated in the lay mind with criminal identification to the detriment of the other useful phases of the science. However, the Civil File of the Identification Division of the Federal Bureau of Investigation contains three times as many fingerprints as the Criminal File. These civil fingerprints are an invaluable aid in identifying amnesia victims, missing persons and unknown deceased. In the latter category, the victims of major disasters may be quickly and positively identified if their fingerprints are on file, thus providing a humanitarian benefit not usually associated with fingerprint records.

The use of fingerprints for identification purposes is based upon distinctive ridge outlines which appear on the bulbs on the inside of the end joints of the fingers and thumbs. These ridges have definite contours and appear in several general pattern types, each with general and specific variations of the pattern, dependent on the shape and relationship of the ridges. The outlines of the ridges

appear most clearly when inked impressions are taken upon paper, so that the ridges are black against a white background. This result is achieved by the ink adhering to the friction ridges. Impressions may be made with blood, dirt, grease or any other foreign matter present on the ridges, or the saline substance emitted by the glands through the ducts or pores which constitute their outlets. The background or medium may be paper, glass, porcelain, wood, cloth, wax, putty, silverware or any smooth, non-porous material.

1. In the second paragraph, what is the function of the sentence *However, the Civil File of the Identification Division of the Federal Bureau of Investigation contains three times as many fingerprints as the Criminal File*?
 - (A) To explain how fingerprints can have humanitarian uses such as helping to identify victims of natural disasters.
 - (B) To illustrate the importance of fingerprints in different fields.
 - (C) To state that the Civil File of the FBI has more fingerprints than does the Criminal File.
 - (D) To point out that fingerprints have another more important use that is different from the one that is commonly perceived by the people.
 - (E) To conclude that fingerprints play an important secondary role in the civil society as well.
2. From the information in the passage, which of the following can be most properly inferred?
 - (A) Fingerprint impressions obtained with the use of ink are better than those obtained using substances such as dirt or grease.
 - (B) Fingerprints have many more uses in criminal investigation than they do in civil cases.

- (C) The matching of fingerprints is the most foolproof way of apprehending hardened criminals.
 - (D) The use of fingerprint records helps the justice system deliver more equitable sentences.
 - (E) The presence of saline substances on the ridges of fingertips makes it difficult to get a definite fingerprint impression.
3. What is the main purpose of the author in writing the passage?
- (A) To explain the need for collecting fingerprints.
 - (B) To advocate the study of civil fingerprints to assist the judiciary.
 - (C) To analyse the implications of maintaining a database of fingerprints.
 - (D) To praise the advocates for bringing to justice the repeat offenders.
 - (E) To discuss the history, usefulness and mode of collecting fingerprints.
4. According to the information in the passage, the impressions of the fingerprints can be obtained from all of the following, EXCEPT:
- (A) Saline substances
 - (B) Ink
 - (C) Grease
 - (D) Wax
 - (E) Perspiration

Passage 8 *(Real NMAT Question)*

A science fiction writer coined the useful term 'cyberspace' in 1982, but the territory in question, the electronic frontier, is about 130 years old. Cyberspace is the 'place' where a telephone conversation appears to occur. Not inside your actual phone, but the plastic device on your desk. Not inside the other person's phone, but in some other city. The place between the phones. The indefinite place out there, where the two of you, two human beings, actually meet and communicate. Although it is not exactly 'real', 'cyberspace' is a genuine place. Things happen there that have very genuine consequences. This 'place' is not 'real', but it is serious, it is earnest. Tens of thousands of people have dedicated their lives to it, to the public service of public communication by wire and electronics.

People have worked on this 'frontier' for generations now. Some people became rich and famous from their efforts, while some just played in it, as hobbyists. Others soberly pondered it, and wrote about it, and regulated it, and negotiated over it in international forums and sued one another about it, in gigantic, epic court battles that lasted for years. And, almost since the beginning, some people have committed crimes in this place.

But in the past 20 years, this electrical 'space', which was once thin and dark and one-dimensional—little more than a narrow speaking tube, stretching from phone to phone—has flung itself open like a gigantic jack-in-the-box. Light has flooded upon it, the eerie light of the glowing computer screen. This dark electric netherworld has become a vast flowering electronic landscape. Since the 1960s, the world of the telephone has crossbred itself with computers and television, and *though there is still no substance to cyberspace*, nothing you can handle, it has a strange kind of physicality now. It makes good sense today to talk of cyberspace as a place all its own because people live in it now. Not just a few people, not just a few technicians and eccentrics, but thousands of people, quite normal

people—and not just for a little while either, but for hours straight, over weeks, and months and years. Cyberspace today is a ‘Net’, a ‘Matrix’, international in scope and growing swiftly and steadily. It is growing in size, wealth and political importance.

1. Which of the following cannot be inferred from the information in the passage?
 - (A) The term ‘cyberspace’ has been in use for over a century.
 - (B) People have used cyberspace to make profits.
 - (C) Cyberspace is not really a physical place.
 - (D) Regulations have been made governing cyberspace.
 - (E) Some people have used cyberspace to commit crimes.
2. What is the main purpose of the third paragraph in the passage?
 - (A) To underline the importance of cyberspace.
 - (B) To delineate the underlying threat of cyberspace to normal man.
 - (C) To explain how cyberspace means different things to different people.
 - (D) To discuss the changes that have taken place in cyberspace in the last two decades.
 - (E) To discuss the political and social impact of cyberspace.
3. Which of the following would the author of the passage not agree with?
 - (A) Cyberspace includes email, social media websites, e-commerce and so on.
 - (B) It would be incorrect to consider cyberspace an individual entity.
 - (C) Books have been written about cyberspace.

- (D) Modern cyberspace is an amalgam of telephones and computers.
 - (E) Thousands of people are involved with cyberspace in some way or the other.
4. Which of the following words is the most opposite in meaning to the word *superfluous* as used in the passage?
- (A) Redundant
 - (B) Gratuitous
 - (C) Immanent
 - (D) De trop
 - (E) Verbose

Passage 9 *(Real NMAT Question)*

In Chennai, the annual turtle-walk is an event that environmental enthusiasts have begun to look forward to year after year. Walkers interact with each other to create and increase awareness about the endangered species. Environmentalists have managed to garner enough interest in the walk—so much so, that every year, there are new volunteers joining the group trying to help the Olive turtles, classified under the endangered species in Schedule 1 of the Wildlife Act, survive.

One of the only two species of the genus *Lepidochelys* that is known for arribadas or mass synchronised nesting, the Olive Ridley Turtles nest in the beaches of Chennai between the months of December and April. Measuring about two and a half feet in length, these are the smallest of the sea turtles and are restricted to the Pacific and Indian Oceans.

The walkers, environmental enthusiasts from all walks of life, walk along the beach that extends from Neelankarai to Besant Nagar in Chennai. Each night from about 11 PM to 4 AM, they walk along the beaches looking for turtle eggs buried in the sand, digging them out to relocate them and move them to safer places. Actually, the eggs are moved to a hatchery. Adult turtles are known to come ashore, lay eggs in the sand and return to sea. They never return to their eggs or babies. The turtle eggs have a gestation period of 45 to 50 days after which they hatch.

From the description provided by the walkers, these walks seem to be a memorable experience. Volunteers are trained to identify and follow turtle trails. They have described the nests to be pot-shaped having a narrow neck above a broader chamber base. During the walks, the walkers have often said that they even come across turtles laying eggs. Many of them have also witnessed little baby turtles hatching from the eggs. The babies are completely black when newly born and wet.

The first such walk that took place in Chennai was in the year 1988 and was undertaken by the voluntary organisation Students Sea Turtle Conservation Network or SSTCN. Turtle walks notwithstanding, year 2012 reportedly saw a drop in the count of turtles. Thankfully, year 2013 found 213 nests, the highest since the previous best of 1991 when 203 turtle nests were found, giving hope and reason to believe that despite rampant fishing activities and rapid urbanisation along the coasts resulting in the endangering of these warm and tropical-water sea turtles, the turtles are surviving.

1. How would you describe the tone of the passage?
 - (A) Sad
 - (B) Cheerful
 - (C) Informal
 - (D) Descriptive
 - (E) Non-committal
2. The passage does not mention that the Olive turtles:
 - (A) are protected under the Wildlife Act.
 - (B) are being threatened by coastal urbanisation.
 - (C) do not bother about their babies after they lay eggs.
 - (D) hatch baby turtles that are black when newly born and wet.
 - (E) on the Chennai beaches have been consistently increasing.
3. The passage:
 - (A) describes arribadas as mass-synchronised nesting.
 - (B) does not mention the gestation period of the Olive turtles.
 - (C) mentions Olive turtles to be the only species known for arribadas.

- (D) does not mention anything about volunteers witnessing the actual hatching process.
- (E) mentions that the highest number of turtle nests were found during the walks of Year 1991.

4. Which of the following is not mentioned in the passage?

- (A) The walkers dig out buried turtle eggs from the sand and relocate them to safer places at night.
- (B) The Olive Ridley Turtles' nests are pot-shaped having a narrow neck above a broader chamber base.
- (C) There is reason to believe that the Olive Ridley Turtles are surviving despite the threats to them from rapid urbanisation.
- (D) The about two and a half feet long Olive Ridley Turtles nest in the beaches of Chennai between the months of December and April.
- (E) Environmental enthusiasts look forward to the bi-annual Chennai turtle-walk so as to be able to discuss ways of protecting the endangered species.

Passage 10 **(Real NMAT Question)**

As an author of short stories, plays and novels, Charles Dickens became known the world over for endearing characterisation, vivid narration of ordinary lives, and depiction of the social and moral values of his time. For years, Dickens thrilled the readers with his simple stories about simple people forced into real situations.

Although Dickens wanted to make a lot of money from his writings, his works invariably aimed to influence the consciousness of his readers even though it seemed like he knew what his readers wanted.

To some critics, Dickens was an entertainer and his novels lacked intellectual challenge, but the *London Times* described the British author as the greatest instructor of the nineteenth century in his obituary. The unparalleled sentimentality, rage, plight and bitterness in his novels established Dickens as a spokesman for the downtrodden.

Dickens was born on February 7, 1812 into a poor family in Portsmouth on the southern coast of England. He was the second of eight children. In 1822, the Dickens family moved to Camden Town, a poor neighbourhood in London. The extravagance of his father often brought financial embarrassment to the family and eventually imprisonment for him in 1824. This brought an abrupt end to Dickens' childhood. He had to discontinue his schooling and support his family by doing manual work at a factory. Young Dickens was rudely introduced to long hours of harsh working conditions and poor pay. He felt orphaned and betrayed by his parents who he believed should have taken care of him in his childhood. These feelings later became a recurring theme of many of his novels. Characters like Oliver Twist and David Copperfield developed from the harsh experiences of Dickens' early life.

Dickens' literary journey started in 1833 when he submitted sketches to various magazines and newspapers under the nickname "Boz". In 1836, he published *The Posthumous Papers of the Pickwick Club*, which became widely popular with magazine readers. Soon, his first novel, *Oliver Twist*, depicting the life of an orphan and inspired by Dickens' own experience as an impoverished child, hit the stands. The overwhelming success of *Oliver Twist* turned Dickens into a celebrity and over the next few years he had to struggle to match the literary and commercial standard the book had set.

In 1842, Dickens and his wife, Kate, went on a tour of the United States, where people went crazy listening to him. Upon his return, Dickens wrote *American Notes for General Circulation*, a sarcastic travelogue criticising American culture and materialism.

Over the next couple of years, Dickens published two Christmas stories including the classic *A Christmas Carol*. From 1849 to 1850, Dickens worked passionately on his favourite novel *David Copperfield*, a sort of autobiography and probably the first work of its kind.

The death of his daughter and father and separation from his wife in the 1850s cast a dark shadow on Dickens' writing during this period. He returned to his original style with *A Tale of Two Cities* in 1859, a historical novel, followed by *Great Expectations* in 1861, widely considered his greatest literary feat.

On June 9, 1870, Dickens suffered a stroke and died at his country home in Kent, England.

1. The author most likely agrees with all of the following statements EXCEPT:
 - (A) Dickens blamed his parents for enduring a harsh childhood.
 - (B) Dickens was not impressed by the materialism of the American society.

- (C) Dickens' novels portrayed the attitude of the society towards the downtrodden.
 - (D) To some of his critics Dickens was an entertainer and his writing was not intellectually challenging.
 - (E) *David Copperfield*, a biographical account of Dickens' life, is often cited as his best literary achievement.
2. The passage is primarily concerned with:
- (A) Dickens' novels and his characters.
 - (B) Dickens' success as a writer.
 - (C) Dickens' harsh childhood.
 - (D) Dickens' life story.
 - (E) Dickens' writing.
3. Which of the following statements is best taken to be true in the context of the passage?
- (A) Dickens played the role of an instructor through his writings.
 - (B) Dickens was the best British author of the nineteenth century.
 - (C) No other Dickens' novel could ever match the standard set by *Oliver Twist*.
 - (D) Dickens' writing became sarcastic after the death of his daughter and father.
 - (E) All of Dickens' novels were based on the personal experiences of his childhood.
4. Which of the following statements, if true, would most weaken the author's argument?
- (A) Dickens' parents were responsible for his harsh childhood.

- (B) Dickens sympathised with his characters who often survived a life of struggle.
- (C) Dickens' writing emphasised how simple people got forced into real situations.
- (D) Characterisation of David Copperfield and Oliver Twist are suggestive of Dickens' harsh life.
- (E) Dickens wrote his classics during the period of shock that he experienced after the deaths of his daughter and father.

Passage 11 *(Real NMAT Question)*

A team of scientists needs to understand the impact of a nuclear explosion on a concrete bunker. Another team of engineers is trying to design an airplane that can withstand high wind shear while flying. It is not always possible to carry out direct experimentation or trial to test many real-life situations. Herein, lies the need for developing a modelling system that can incorporate all variables and data to produce a result that can help study the phenomenon at hand. This modelling system is what we call computer simulations. They were first designed as a tool to study metrological phenomenon and nuclear physics. The list has steadily grown to incorporate many other areas of modern society like medical sciences, construction, economics, astrophysics etc.

A computer simulation is a computer programme or a model that tries to recreate a model of a particular system in a virtual world. For example, if you want to see the impact of a comet striking Earth, you do not want to wait for a real event, but you also do not want to be caught napping before such an event actually occurs. So, what you do is create a virtual system which resembles a real-world system with objects similar to Earth and the comet, along with parameters like speed, atmosphere, mass etc., as close to reality as possible. This may seem like some grandiose plan of science fiction, but even medical science benefits by using simulations to see the impact of new medicines, thereby helping to cut down risks associated with clinical trials. Architects use the same modelling approach before designing a new bridge or a skyscraper.

There are different types of simulation models. First is the discrete model in which the changes to the system occur at specific times. Second is the continuous model in which the state of the system changes continuously over time. Third is the mixed model in which both discrete and continuous elements are contained. The type of data needed to build a computer simulation includes: the overall

process flow, what is being produced or acted on (entities), frequencies at which the entities arrive in the programme, the length of time individual steps in the process take, probability distribution that characterise real-life uncertainties and variations in the process.

Computer simulations are also helpful in analysing “what if” scenarios. The advantages of computer simulations include gaining a greater understanding of the process; identifying any potential obstructions or flaws; being able to effectively evaluate processes which have changing variables and even help mitigate possible problems. Computer simulations have indeed provided an enormous impetus to how we do our research and planning.

1. What is the primary purpose of this passage?
 - (A) Refute the importance of computer simulation.
 - (B) Discuss simulation, their uses and advantages.
 - (C) Outline the developmental history of simulations.
 - (D) Debate the pros and cons of computer simulation.
 - (E) Describe one particular application of the simulation.
2. Based on the passage, which of the following best describes the author’s tone when writing about computer simulations?
 - (A) Wry humour
 - (B) Bitter sarcasm
 - (C) Open optimism
 - (D) Veiled cynicism
 - (E) Forthright scepticism
3. The author mentions all of the following EXCEPT:
 - (A) simulations have reduced the need for direct experimentation.

- (B) simulations are able to account for changing variables in a system.
 - (C) simulations have a limited capacity to evaluate hypothetical scenarios.
 - (D) studying the effects of a new drug being developed can be aided by simulations.
 - (E) the amount of traffic a new bridge in the city can handle can be gauged with simulations.
4. Based on the given information, what can be inferred about the author's opinion of the use of computer simulations in medicine?
- (A) The author is sceptical.
 - (B) The author is circumspect.
 - (C) The author remains neutral.
 - (D) The author supports its use.
 - (E) The author is against its use.

Passage 12 *(Real NMAT Question)*

Almost every regulatory policy is created to achieve some desirable social goal. When more than 10,000 people are killed annually in industrial accidents, who would disagree with the goal of a safer workplace? Who would dissent from greater highway safety, when more than 50,000 perish each year in automobile accidents? Who would disagree with policies to promote equality in hiring, when the history of opportunities for women and minorities is one of discrimination? Who would disagree with policies to reduce industrial pollution, when pollution threatens health and lives? However, there may be more than one way to achieve these—and many other—desirable social goals.

Charles L. Schultze, chair of former President Carter's Council of Economic Advisors, is a critic of the current state of federal regulation. Schultze reviewed the regulatory activities of the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). Neither agency's policies, he concluded, had worked very well. He described the existing system as command and control policy. The government tells business how to reach certain goals, checks that these commands are followed, and punishes offenders.

Schultze advocates an incentive system. He argues that instead of telling construction businesses how their ladders must be constructed, measuring the ladders, and charging a small fine for violators, it would be more efficient and effective to levy a high tax on firms with excessive worker injuries. Instead of trying to develop standards for 62,000 pollution sources, as the EPA now does, it would be easier and more effective to levy a high tax on those who cause pollution. The government could even provide incentives in the form of rewards for such socially valuable behaviour as developing technology to reduce pollution. Incentives, Schultze argues, use market-like strategies to regulate industry. They are, he

claims, more effective and efficient than command-and-control regulation.

Not everyone is as keen on the use of incentives as Schultze. Defenders of the command-and-control system of regulation compare the present system to preventive medicine—it is designed to minimise pollution or workplace accidents before they become too severe. Defenders of the system argue, too, that penalties for excessive pollution or excessive workplace accidents would be imposed only after substantial damage had been done. They also add that if taxes on pollution or unsafe work environments were merely externalised (that is, passed along to the consumer as higher prices), they would not be much of a deterrent.

Moreover, it would take a large bureaucracy to monitor carefully the level of pollution discharged, and it would require a complex calculation to determine the level of tax necessary to encourage businesses not to pollute.

1. What is the central idea of the passage?
 - (A) Regulatory activities of government exist at different levels.
 - (B) The pros and cons of using the incentive system were proposed by Schultze.
 - (C) The old policies framed for workplaces could not be successful for several reasons.
 - (D) An overview of the regulatory policies for achieving social goals and how the incentive system can be helpful.
 - (E) How different regulatory policies that encourage specific social behaviours in different set-ups have failed miserably.
2. In Charles Schultze's argument, the claim is that:

- (A) the use of the incentive policy is limited to just a few situations.
 - (B) the EPA and OSHA should not tell businesses how to regulate themselves.
 - (C) regulatory policies should be created to achieve certain desirable social goals.
 - (D) the government should minimise pollution and workplace accidents before they become too severe.
 - (E) an incentive system would be more effective and efficient than the command-and-control regulation.
3. According to the author, what can be concluded from the passage?
- (A) Goals leading to safer workplaces were not achieved.
 - (B) If incentives are provided, social goals can be achieved.
 - (C) Socially desirable behaviours need to be achieved to fulfill social goals.
 - (D) There are several ways in which socially desirable goals can be achieved.
 - (E) Schultze's incentive system has received acceptance as well as criticism from people.
4. According to the passage, the author most likely agrees with all of the following statements EXCEPT:
- (A) Incentives, in the form of rewards, could be given for socially valuable behaviours.
 - (B) An incentive system would reward businesses that develop technology to reduce pollution.
 - (C) An incentive system would involve developing standards for thousands of pollution sources.
 - (D) Regulatory policies have been created to address workplace and highway safety, discrimination and

pollution.

- (E) The command-and-control system punishes businesses that do not reach certain goals set by the government.

Passage 13 *(Real NMAT Question)*

Cancer, a word that elicits dread in nearly everyone, continues to puzzle scientists. Despite attempts made by science to decipher this terrible disease, scientists still struggle to find an answer to questions such as, ‘why does cancer strike some and not others?’, ‘Are its ‘seeds’ part of our genetic makeup?’

Different terms are used when discussing cancer. *Neoplasm* is an abnormal cell mass that develops when the controls of the cell cycle and cell division malfunction. However, all neoplasms are not cancerous. *Benign* neoplasms do not spread, and are always seen to be local affairs. They are usually surrounded by a capsule and grow slowly, seldom killing their hosts if they are removed before they affect vital organs. *Malignant* neoplasms, on the other hand, are non-encapsulated, grow more relentlessly and can even kill. They resemble immature cells and invade their surroundings rather than push them aside. Malignant cells are also capable of *metastasis*—i.e., they tend to spread via blood to distant parts of the body and form new masses.

But what causes the *transformation*? In other words, what converts a normal cell to a cancerous one? It is well known that cancer-causing elements or *carcinogens* can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine). All of these have one common factor—all of them cause mutations, which are changes in DNA that alter the expressions of certain genes. Usually carcinogens are eliminated by the immune system or certain enzymes. It must also be stated here that it takes much more than just one mutation to change a normal cell into a full-fledged cancer cell.

It was with the discovery of *oncogenes* (cancer causing genes) followed by *proto-oncogenes* that the role of genes started to gain prominence. Although proto-oncogenes code for proteins that are needed for normal cell division and growth, many of them have

fragile areas that break when exposed to carcinogens, converting them to oncogenes. As a result, problems such as, 'switching on' of dormant genes that allows cells to become invasive, arise. Oncogenes have been discovered in only 15 to 20 percent of human cancers. Therefore, it came as no surprise when the tumour suppressor genes were discovered recently – these, as their names suggest, suppress or prevent cancer. The tumour suppressor genes not only put the 'brakes' on cell division but they help with DNA repair and help to deactivate carcinogens, thereby enhancing the immune system's ability to destroy cancer cells. It is when the tumour suppressor genes are damaged or changed in some way, that the oncogenes are free to 'do their thing'. Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate!

1. What is the central idea of the passage?
 - (A) evolution of cancer
 - (B) role of genes in cancer
 - (C) early warning signs of cancer
 - (D) procedures for detecting cancer
 - (E) how an abnormal cell mass can cause cancer
2. According to the passage, cancer is an 'intimate enemy' because:
 - (A) of the kind of treatment available for cancer.
 - (B) most of us know someone who has had cancer.
 - (C) it is closely related to the body's immune system.
 - (D) it brings people affected by cancer closer together.
 - (E) the 'seeds' of cancer appear to be in our own genes.
3. According to the author, what can be concluded from the passage?

- (A) Occurrence of cancer depends on our genetic make-up.
 - (B) Abnormal masses in the body are the sole reason for cancer.
 - (C) Cancer has now become a very common disease and can be treated easily.
 - (D) There are several factors that cause cancer and genes play a significant role.
 - (E) Though cancer is a dreadful disease, there are several promising new treatments.
4. According to the passage, the author most likely agrees with all of the following statements EXCEPT:
- (A) Surgical removal is a treatment for benign neoplasm.
 - (B) It takes only one genetic mutation to make a normal cell cancerous.
 - (C) Most carcinogens are eliminated by enzymes or the immune system.
 - (D) Carcinogens cause changes in DNA that alter the expression of genes.
 - (E) Chemicals such as tobacco tar and saccharine can act as carcinogens.

Passage 14 ***(Real NMAT Question)***

According to the first ever World report on disability, produced jointly by WHO and the World Bank, over one billion people, or about 15% of the world's population, are believed to have some form of disability. Of these, 110 million people (2.2%) have highly significant difficulties in normal functioning and 50% of the disabled cannot afford healthcare. Sadly, the number of disabled people is growing.

Although the patterns of disability in different countries vary depending on health conditions, personal factors and environmental factors, two major reasons which account for higher prevalence of disability are ageing and rise in chronic health conditions such as diabetes, cardiovascular diseases and mental illness.

Disability, to a certain extent, correlates with disadvantage. The World Health Survey indicates higher prevalence of disability in lower income countries than in higher income countries. On average, persons with disabilities, and families with a disabled member, experience higher levels of deprivation including food insecurity and poor housing.

Increasing evidence suggests that people with disabilities experience poorer levels of health, they are more exposed to violence, children are less likely to get an education and discrimination becomes a barrier to disabled employees receiving promotion opportunities within jobs.

Global data from the World Health Survey show that employment rates are lower for disabled men (53%) and disabled women (20%) than for non-disabled men (65%) and women (30%).

People with disabilities get most support from family members or social networks. However, exclusive dependence on families can have adverse effect on caregivers, including stress, isolation and lost

socioeconomic opportunities. These difficulties increase as family members age.

The Report documents widespread evidence of barriers in different countries. In some countries the policies are either faulty or the resources allocated to implementing policies are often inadequate. For example, lack of financial incentive in education policy fails to motivate children with disabilities to attend school.

In many regions of the world, misconceptions and prejudices affect the inclusion of children with disabilities in mainstream education and the progress of disabled employees in jobs.

The data in the Survey from four Southern African countries found that only 26–55% of people received the medical rehabilitation and 5–23% received the vocational training they needed. The data from 51 countries also revealed that people with disabilities were four times more likely to be treated badly and nearly three times more likely to be denied needed health care.

Lack of access to transport discourages persons with a disability from seeking work or accessing health care. In some poor and less developed countries, they are unable to access even basic information and communication products and services such as telephones, television, and the Internet. Often people with disabilities are excluded from decision-making processes in matters directly affecting their lives.

A lack of comprehensive data on disability can impede understanding and action. Getting a fair idea of the numbers of people with disabilities and understanding their circumstances can help in removing disabling barriers and in facilitating people with disabilities to participate.

1. In the context of the passage, all of the following rightly depict the condition of persons with disabilities, EXCEPT:

- (A) around 2.2% of the world's population suffer from a severe disability which prevents them from having normal participation in society.
- (B) availability of comprehensive data on disability can help the governments design appropriate plans for rehabilitation of persons with a disability.
- (C) heavy dependence on families by persons with a disability in the long run can result in stress, isolation, and lost socioeconomic opportunities for caretakers.
- (D) two major reasons which account for higher prevalence of disability are ageing and rise in diseases such as diabetes, cardiovascular diseases, and mental illness.
- (E) data suggests that prejudice and misconceptions in society have a higher adverse impact on the conditions of the persons with a disability than poor funding of the plans for them.

2. The author brings into discussion the topic of school education for children with disabilities, most likely to:

- (A) prove that persons with disabilities, and families with a disabled member, experience higher levels of deprivation including housing, food security and education.
- (B) lend credibility to the contention that discrimination begins early in the life of persons with a disability.
- (C) suggest that there exists higher prevalence of disability among lower income groups.
- (D) support the claim that disability correlates with disadvantage brought about through both bad policies and social prejudices.
- (E) introduce the topic of discrimination in schools.

3. Which of the following statements about disadvantages to persons with a disability in the work place is most clearly supported by the passage?
- (A) Discrimination becomes a barrier to disabled people getting a job.
 - (B) Among persons with a disability only 5–23% employees receive the vocational training they need.
 - (C) Lack of access to transport discourages persons with a disability from seeking employment.
 - (D) Owing to the prevalence of discrimination in work places, getting ahead in careers becomes difficult for employees with a disability.
 - (E) Global data from the World Health Survey shows that in comparison to 65% employment rate for non-disabled men, it is 53% in case of persons with a disability.
4. The passage emphasises which of the following points about data?
- (A) Lack of comprehensive data on disability can prove to be a barrier in understanding and action.
 - (B) Data documents the evidence of misconceptions and prejudice towards persons with a disability.
 - (C) Data indicates that disabled men face higher discrimination as compared to disabled women.
 - (D) The rise in the number of persons with a disability is more in lower income countries than higher income countries.
 - (E) The data from four South-African countries is a good sample for the rest of lower income countries.

2 Para Forming

Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

1. (*Real NMAT Question*)

- (a) The colony was then named Port Cornwallis after Admiral William Cornwallis.
- (b) This penal colony is now known as Port Blair (after the officer who founded it).
- (c) However, disease and death in the penal colony forced the government to cease its operations in May 1796.
- (d) After two years, this colony moved to the northeast part of Great Andaman.
- (e) In 1789, the government of Bengal established a penal colony on Chatham Island in the southeast bay of Great Andaman.

- (A) cdbae
- (B) adcbe
- (C) badce
- (D) abcde
- (E) edacb

- 2.**
- (a) Only then can any virus make use of its single talent, which is to take control of a host's cellular machinery and use it to churn out thousands of copies of itself
 - (b) In this way, one infected cell soon becomes billions.
 - (c) These viruses then move from one cell to the next, transforming each new host into a factory that makes even more virus.

- (d) A virus is nothing more than a few strands of genetic material wrapped in a package of protein—a parasite, unable to function on its own.
 - (e) In order to survive, it must find a cell to infect.
 - (A) dceab
 - (B) bcead
 - (C) deacb
 - (D) decab
 - (E) bdcea
- 3.
- (a) If this is so, then public spaces function like a stage in the same way that our own homes and living rooms do.
 - (b) Several scholars over the years have drawn analogies between life and theatre.
 - (c) For instance, the eminent sociologist Erving Goffman suggested that life is a series of performances, in which we are all continually managing the impression we give other people.
 - (d) Architecture, landscaping, the dimensions of the stage, and the other actors around us all offer cues about how we should perform and how we should treat one another.
 - (A) acdb
 - (B) badc
 - (C) cdeb
 - (D) edcb
 - (E) bcad
- 4.
- (a) Self-driving cars promise to create a new kind of leisure, offering passengers additional time for reading books,

writing emails, knitting, taking a catnap, and any number of other diversions.

- (b) People who are unable to drive themselves could experience a new kind of independence.
- (c) Moreover, self-driving cars could re-contextualise land use on a massive scale.
- (d) In this imagined mobility utopia, drone trucks would haul packages across the country and no human would have to circle a city block in search of a parking spot.

- (A) adbc
- (B) acbd
- (C) cbad
- (D) abcd
- (E) bacd

5. (a) The reward system was about pleasure and somehow learning what yields it, and little more.

- (b) If you had opened a textbook on brain rewards in the late 1980s, it would have told you that the dopamine and opioids that swished and flickered around the reward pathway were the blissful brain chemicals responsible for pleasure.
- (c) It wasn't until the early 1990s, after rigorous research, that he felt bold enough to go public with his new thesis.
- (d) So when Berridge, a dedicated young scientist who was more David than Goliath, stumbled upon evidence in 1986 that dopamine did not produce pleasure, but in fact desire, he kept quiet.

- (A) acbd
- (B) badc
- (C) bdac

(D) cbad

(E) cdba

6. (a) Those who do remember him tend to use him as a cautionary tale.

(b) His charismatic personality, combined with his controversial scientific accomplishments, landed him on TV more than once, notably on The Steve Allen Show

(c) Instead of dazzling audiences with complicated science, McConnell captivated them with awe-inspiring concepts

(d) McConnell's experiments have largely faded from scientific memory

(e) But at the end of the '50s, McConnell was a big deal

(A) cdbae

(B) bcdae

(C) daebc

(D) edcba

(E) aedbc

7. (a) The band stretches from the Tropic of Cancer to the Tropic of Capricorn, though there are occasional reefs at higher latitudes—near Bermuda, for instance.

(b) Reefs can be hundreds of feet tall and thousands of acres in area.

(c) The world's largest reef, or really reef system, is the Great Barrier Reef, along the east coast of Australia.

(d) Coral reefs are found in a band that circles the globe like a cummerbund.

(e) Unlike the Great Wall of China, the Great Barrier Reef, which extends more than fourteen hundred miles, is actually visible from the space.

- (A) acdeb
- (B) dacbe
- (C) aedbc
- (D) dbcea
- (E) cdaeb

8. (*Real NMAT Question*)

- (a) As I got off at Terminal B, I couldn't help marvelling at the vastness of the O'Hare Airport.
 - (b) My husband, who was very concerned that I was travelling alone, printed out a map of the airport before I left.
 - (c) Since I did not have any pressing demands on my time, I decided to make the trip.
 - (d) My sister, who lived in Seattle, wanted us to be present at her house-warming ceremony.
 - (e) Although we tried very hard, we were able to obtain only one ticket for that date.
- (A) abdec
 - (B) badec
 - (C) cdeba
 - (D) dceba
 - (E) decba

9. (*Real NMAT Question*)

- (a) No wonder companies everywhere have a stake in the health and fitness of their employees and are willing to spend considerable amounts for this purpose.
- (b) Our health is important to us, to our families and to our employers.

- (c) This is considered an important factor contributing to high productivity and quality work.
 - (d) Japanese companies particularly excel in this and the more successful among them start off the day with a body bending and stretching session.
 - (A) dbac
 - (B) abdc
 - (C) cabd
 - (D) badc
 - (E) bcda
- 10.**
- (a) Logging operations, which provide the world's wood and paper products, also cut countless trees each year.
 - (b) Often, small farmers will clear a few acres by cutting down trees and burning them in a process known as slash and burn agriculture.
 - (c) The biggest driver of deforestation is agriculture.
 - (d) Farmers cut forests to provide more room for planting crops or grazing livestock.
 - (a) cdab
 - (B) cdba
 - (C) cbda
 - (D) dcba
 - (E) dcab
- 11.**
- (a) Point-of-sale advantages include stores offering no shipping charges and free ship-to-store charges.
 - (b) The internet can be a great resource for shoppers looking to expand their choices of products to buy and an invaluable way for saving money.

- (c) Price-comparison websites make deal hunting easier and also help guide shoppers to online stores with the best reputations by posting reviews submitted by other shoppers.
 - (d) Online stores are highly competitive not only with other online stores, but also with brick-and-mortar competitors.
- (a) dbac
(B) bdca
(C) bdac
(D) acbd
(E) dbca
- 12.** (a) Nearly 24 hours after the snafu, Oscars host Jimmy Kimmel broke his silence on the shocking moment with a few words on his show, *Jimmy Kimmel Live*.
- (b) "I don't know if you know this but I hosted the Oscars last night," Kimmel quipped, opening his ABC show.
- (c) La La Land was incorrectly named the Best Picture when Moonlight was really the winner.
- (d) In case you've been living under a rock, the Oscars were rocked by an epic mistake on Sunday night.
- (a) abdc
(B) bdca
(c) bdac
(D) abcd
(E) dcab
- 13.** (a) Thus, they are more at risk for adult health problems such as heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis.

- (b) According to an article in *The New York Times* all of these health effects are contributing to a shorter lifespan of five years for these obese children.
 - (c) One study showed that children who became obese as early as age 2 were more likely to be obese as adults.
 - (d) Children who are obese are likely to be obese as adults.
- (a) cdba
 - (B) cbda
 - (C) dcab
 - (D) dcba
 - (E) dbac

- 14.** (a) Not a bad legacy for a man who, after his first studio went belly up, placed his career in the hands of a cartoon mouse.
- (b) While he was at it, he built fantastical amusement parks, developed a brand recognised by children and adults all over the world, and created an educational foundation for future entertainment innovators.
 - (c) The Walt Disney Company, which reported more than \$38 billion in revenue in 2010, was started by a high-school dropout who loved to draw and had a passion for learning.
 - (d) Walt Disney founded an empire on fantasy and risk taking.
- (a) cdab
 - (B) cdba
 - (C) cbda
 - (D) dcba
 - (E) dcab

- 15.** (a) The Land of Morning Calm is rapidly becoming one of Asia's most popular destinations.
- (b) Since then an Olympics and a World Cup have kick-started a vibrant modern economy.
- (c) South Korea's rise has been nothing short of meteoric after breaking from military dictatorship in the 80s.
- (d) Almost every year South Korea or Seoul features on top ten lists of the best places to visit, and with good reason.

- (a) cbda
- (b) cdba
- (c) bdac
- (d) bdca
- (e) adcb

- 16.** (a) But even as the vote pushed the bill past its latest test, it set up a critical few hours in which Republicans will have to address serious and at times contradictory criticism of the bill from their own caucus, with zero chance of support from Democrats.
- (b) Senate Republican leaders breathed a collective sigh of relief on Wednesday as all 52 GOP senators voted to begin debate on the tax reform bill.
- (c) For Republicans, time is of the essence.
- (d) If they do not pass the tax reform bill this week, it will be sidelined by next week's legislative struggle to secure funding to avoid a government shutdown.

- (a) abdc
- (b) bdca
- (c) bdac
- (d) bacd

(e) dcab

17. (*Real NMAT Question*)

- (a) Hydraulic fracturing occurs when the effective stress is reduced sufficiently by an increase in the pressure of fluids within the rock, such that the minimum principal stress becomes tensile and exceeds the tensile strength of the material.
- (b) This is particularly so in the case of “tensile” fractures, which require the walls of the fracture to move apart, working against this confining pressure.
- (c) Fracturing in rocks at depth tends to be suppressed by the confining pressure due to the load caused by the overlying rock strata.
- (d) Fractures formed in this way will be oriented in a plane perpendicular to the minimum principal stress, and for this reason induced hydraulic fractures in wellbores are sometimes used to determine the orientation of stresses.

(A) cbad

(B) cabd

(C) cadb

(D) abcd

(E) acdb

18. (a) Great players end their careers with anywhere from 25 to 50 such scores.

(b) Every sport has record breakers, but of his contemporaries, only Michael Jordan, Lance Armstrong and prescandal Tiger Woods come anywhere close to matching him in redefining the realms of possibility.

- (c) In cricket, a batsman who hits a century, or a “ton”--another term for a 100-plus-run innings--displays the most consistent measure of batting prowess.
 - (d) Tendulkar’s ton of tons is beyond great.
 - (a) dbac
 - (b) cadb
 - (c) cbda
 - (d) bdca
 - (e) dbca
- 19.**
- (a) In recent years, with the master crippled by rheumatoid arthritis, Swinston or another veteran often led students and company dancers through the steps.
 - (b) A little before 6 p.m., some 40 current and former dancers, in warm-up clothes or street garb, drifted onto the wooden floor.
 - (c) As a pianist picked out strains of Bach, Robert Swinston, a longtime Cunningham dancer who was also the choreographer’s assistant, held an abbreviated class in Cunningham technique.
 - (d) On July 27, the day after the choreographer Merce Cunningham died, there was an open house at the West Village studio in which his dance company has operated since 1971.
 - (a) dbac
 - (b) bdca
 - (c) bdac
 - (d) acbd
 - (e) dbca

- 20.** (a) The fork is held with the left hand and the knife is held with the right.
- (b) When no knife is being used, the fork can be held with the tines up.
- (c) The fork is held generally with the tines down using the knife to cut food or help guide food on to the fork.
- (d) With the tines up, the fork balances on the side of the index finger, held in place with the thumb and index finger.
- (a) abdc
- (b) acbd
- (c) bdac
- (d) bdca
- (e) dcab
- 21.** (a) Doyle was born in Edinburgh in 1859, one of nine children of an alcoholic Irish artist who was consigned, in later life, to a lunatic asylum.
- (b) One can break the answer down into a mix of elements.
- (c) Why has Holmes continued to captivate generation after generation when other fictional detectives of the Victorian period are forgotten?
- (d) But first it will be useful to summarise the life of Holmes's creator.
- (a) cdba
- (b) cbda
- (c) acdb
- (d) acbd
- (e) dbac

22. (a) Furthermore, kids are also a viable market because they can easily influence lifestyle, and provide a view of overall trends in society; how it is now and what it is likely to become.
- (b) The advertising industry views teenagers in society as a viable market segment, because of their immature understanding of the media and its dazzling impact on teen and young undeveloped brains.
- (c) According to marketing research companies, teenagers are important to marketers because they can spend a substantial open income, spend family money easily, and they are easily able to influence their families to spend on large and small household purchases that appeal to them.
- (d) The media is increasingly focusing on kids and adolescents to captivate with advertisements.
- (a) abdc
- (b) acbd
- (c) bdac
- (d) dbca
- (e) dcab

23. (***Real NMAT Question***)

- (a) When an entire lump or suspicious area is removed, it is called an excisional biopsy.
- (b) It involves the removal of cells or tissues to examine and to determine the presence or extent of a disease.
- (c) The removed tissue is examined under a microscope by a pathologist, or is analysed chemically.
- (d) Biopsy is a commonly used medical test these days.

(e) But when only a sample of tissue is removed with preservation, it is incisional or core biopsy.

(A) debca

(B) bedac

(C) dbcae

(D) abdec

(E) abcde

24. (*Real NMAT Question*)

(a) Most of these places are high up on mountains.

(b) This hardened ice is what comprises the glacier.

(c) Repeated snowfalls compress the lower layers of snow.

(d) Glaciers form in extremely cold places.

(e) Finally, the lowest layer hardens and turns into ice.

(A) abedc

(B) dceba

(C) cadeb

(D) cbdae

(E) daceb

25. (*Real NMAT Question*)

(a) Mass outreach to people in the North-East (very often the worried parents) and in Bangalore using SMS and social media, debunking the very specific allegations and rumours that were floating around, would have been welcome.

- (b) Even a Canadian interning in our organisation received a reassuring SMS from the Canadian government.
- (c) The best antidote to the rumours that spread far and wide and caused a mass movement of people would have been clear debunking of those rumours.
- (d) However, almost no government officials actually used social media platforms to reach out to people to debunk false information and reassure them.

- (A) abcd
- (B) cbda
- (C) cabd
- (D) acbd
- (E) abdc

26. (a) He'd say, undoubtedly, that he'd found a nation of poets.
- (b) There was hardly any such thing as slang in his day, for no graphic trope was too virile or uncommon for acceptance, if its meaning were patent.
- (c) If Shakespeare came to Chicago and heard "the man in the street," he'd find himself more at home than in London.
- (d) In the mouths of clerks he'd find English used with all the freedom of unexpected metaphor and the plastic, suggestive diction that was the privilege of the Elizabethan dramatists.
- (e) His own heroes often spoke what corresponds to the slang of today. (**Real NMAT Question**)

- (A) cadeb
- (B) cdeba
- (C) cbdae
- (D) cedba

(E) cdabe

27. (a) Getting involved in a hobby is a better way to beat stress as it provides relaxation, sharpens the mind, increases creativity, and also helps in making friends and acquiring valuable skills.

(b) Regrettably, we now regularly spend our free time watching TV or surfing the internet.

(c) Ironically, modern life has become more stressful when there is more of this free time, and yet the best we do is lie down on the couch.

(d) Just a few years back, free time or leisure time was used as an outlet for doing something different, pursuing one's passion by taking up hobbies. (**Real NMAT Question**)

(A) acdb

(B) dbca

(C) bcda

(D) cdba

(E) badc

28. (**Real NMAT Question**)

(a) In other words, our desire to stand out leads us to do silly things and we, not satisfied with being unique, try to be very unique.

(b) We sometimes go to ridiculous extents to appear unique.

(c) This, of course, is a defect in character which, in adults, stems out of some sort of insecurity that desperately needs to be compensated for.

(d) It leads to such contexts that could perhaps permit the use of expressions like 'very unique'.

- (A) badc
- (B) bdac
- (C) bdca
- (D) abcd
- (E) bcda

29. (*Real NMAT Question*)

- (a) Chiropractic has caused many disabilities and even death in some cases.
 - (b) Yet few chiropractors disclose to their patients the risks of cervical manipulation.
 - (c) This is not necessarily true.
 - (d) Significant risks accompany some alternative therapies.
 - (e) Most people think a treatment is safe if it is alternative.
- (A) dabce
 - (B) dabec
 - (C) ecdab
 - (D) ecdba
 - (E) edabc

- 30.**
- (a) Bees and other insects are vital for global food production as they pollinate three-quarters of all crops.
 - (b) The plummeting numbers of pollinators in recent years has been blamed, in part, on the widespread use of pesticides.
 - (c) The EU banned the use of neonicotinoids on flowering crops that attract bees, such as oil seed rapeseed and so on, in 2013.
 - (d) But in 2017, a major report from the European Union's scientific risk assessors concluded that the high risk to

both honeybees and wild bees resulted from any outdoor use, because the pesticides contaminate soil and water.

- (A) abcd
- (B) bacd
- (C) dabc
- (D) acdb
- (E) adbc

3 Identify the Error

Questions 1–30 each has a sentence with four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

1. In order to lose weight, you need to both eat in small quantities as well as exercise regularly.
(A) to lose
(B) need to
(C) as well as
(D) regularly
(E) No error
2. The artist's most impressive works have been produced at his home in New York, he moved there from his native place, India.
(A) artist's most impressive
(B) have been produced
(C) New York, he moved there
(D) native India
(E) No error
3. Most Indian students pursue their MBAs immediately after completing college, while a few working for two or three years before seeking admission.
(A) pursue their MBAs
(B) completing college, while
(C) working for

- (D) before seeking
(E) No error
4. The client that is coming for a meeting tomorrow is one of our oldest and most important clients.
- (A) that is
(B) for
(C) is one of
(D) most important clients
(E) No error
5. Hoping to receive a permanent position, the intern put in 16 hours of work everyday.
- (A) Hoping
(B) a permanent position
(C) put in
(D) everyday
(E) No error
6. **Although Rajesh studied hard for the test, yet he could only manage 50% marks.**
- (A) studied
(B) for the test
(C) yet
(D) only manage
(E) No error
7. The large and barren expanse of the Sahara desert is at once forbiddingly empty, climatically harsh, and the beauty of it is haunting.
- (A) large and barren

- (B) is at once
- (C) climatically harsh
- (D) the beauty of it is haunting
- (E) No error

8. When Amir met Tiara for the first time, he was thinking that she was very pretty. (*Real NMAT Question*)

- (A) met
- (B) for
- (C) was thinking
- (D) was
- (E) No error

9. The dormant volcano started spewing lava last year and it has been erupting sporadically ever since .

- (A) started spewing
- (B) and
- (C) has been erupting
- (D) ever since
- (E) No error

10. In this store, we sell items sourced from not only Asia but also from the Central and Latin Americas.

- (A) items sourced
- (B) not only Asia
- (C) from
- (D) Central and Latin Americas
- (E) No error

11. The items served in my restaurant are far more diverse and delicious than your restaurant.

- (A) served in
- (B) are far more
- (C) and delicious
- (D) your restaurant
- (E) No error

12. In this museum, there is a large number of artefacts from every historical period, going as far back as the time of the ancient Greek.

- (A) there is
- (B) of artefacts from
- (C) period, going
- (D) as
- (E) No error

13. When enquired as to which course he would prefer to take, Laksh replied that either of the two courses was fine with him.

- (A) as to which
- (B) would prefer
- (C) replied that
- (D) was fine
- (E) No error

14. Each of the eyewitnesses have a different story to narrate about the crime.

- (A) Each of the
- (B) have a

- (C) narrate
- (D) about the crime
- (E) No error

15. Suppose if you were marooned on a deserted island, what would you do?

- (A) Suppose if
- (B) marooned
- (C) what would
- (D) do
- (E) No error

16. The child loves both dancing and singing and refuses to conform by the wishes of his parents.

- (A) both dancing and singing
- (B) refuses
- (C) conform by
- (D) wishes of
- (E) No error

17. When he heard the news of his friend's accident, he immediately returned back to his village.

- (a) he heard
- (b) friend's accident
- (c) returned back
- (d) to his village
- (e) No error

18. The first inning of the match was more interesting than the second one.

- (a) first inning
 - (b) the match
 - (c) more interesting
 - (d) second one
 - (e) No error
19. A major contribution of Maratha sculptors during the medieval age were the creation of the Buddha's images in different human forms. (**Real NMAT Question**)
- (A) A major
 - (B) Maratha sculptors
 - (C) were the creation
 - (D) the Buddha's
 - (E) No error
20. One of the ancient traditions in India commit the guru as well as his disciples to celibacy. (**Real NMAT Question**)
- (A) One of the
 - (B) commit the guru
 - (C) as well as
 - (D) to celibacy
 - (E) No error
21. Retiring C.E.O. Hira Byebye asked his managers to take interest in the management after his retirement. (**Real NMAT Question**)
- (A) Retiring C.E.O.
 - (B) asked his
 - (C) interest
 - (D) after his retirement.

- (E) No error
22. Either of these stuffed toys are suitable for your little four-year-old. (**Real NMAT Question**)
- (A) these
(B) stuffed
(C) are
(D) little
(E) No error
23. We've already paid for our journey; so we need only take some pocket money with us. (**Real NMAT Question**)
- (A) paid for
(B) we need
(C) only take
(D) with us
(E) No error
24. It is a common observation that many a man have resigned to fate. (**Real NMAT Question**)
- (A) a common
(B) many a man
(C) have resigned
(D) to fate
(E) No error
25. After his years of dedicated service to the country, the politician and statesman were honoured at a public felicitation ceremony. (**Real NMAT Question**)
- (A) his years
(B) service to

- (C) and statesman
(D) were honoured
(E) No error
26. He has become too old now, so *it is* necessary that someone looked after him. (**Real NMAT Question**)
(A) has become
(B) too old
(C) it is
(D) looked after
(E) No error
27. A representative of the Bank will provide the students with an insight into the economic future of the country. (**Real NMAT Question**)
(A) A representative
(B) provide the students
(C) insight into
(D) of the country
(E) No error
28. The Indian rupee is again under pressure as rising oil prices has resulted in an increased demand for the dollar.
(A) again under pressure
(B) has resulted
(C) an increased
(D) for the dollar
(E) No Error
29. Please ask your sister to unthaw all the vegetables as I plan to have a smorgasbord of cheese, vegetables and soups.

- (A) ask your
- (B) to unthaw
- (C) as I plan
- (D) have a smorgasbord
- (E) No Error

30. If I was the President, I would have made yoga and meditation compulsory for all.

- (A) If I was
- (B) the President
- (C) I would have made
- (D) compulsory for all
- (E) No Error

4 Choose the Correct Preposition

In questions 1–25, choose the set of prepositions whose meaning and sequence best fits the three given sentences.

1. 1. Krishna said that he would arrive 2 and 3 pm.
2. In the newly constructed shopping mall the shops stay open 11 am to 11 pm.
3. The formalities are all over and the rocket is ready for launch 30 minutes.
(a) at
(b) from
(c) on
(d) in
(e) between
(f) for
(A) bde
(B) cdb
(C) ebd
(D) eca
(E) dbc
2. 1. What seemed like difficult and hectic lectures turned out to be useful and instrumental lessons effective personal development.
2. Even though my teacher was a patient lady, she was quite strict students who were irresponsible and undisciplined.

3. While Jack scored average marks in most of his subject tests, he was, a long way, ahead of his peers when it came to general knowledge. (*Real NMAT Question*)

- (a) against
- (b) towards
- (c) of
- (d) along
- (e) with
- (f) by

- (A) bac
- (B) bef
- (C) dce
- (D) ecb
- (E) fda

3. 1. **The administration's new proposals have been met a lot of opposition from the citizens of the town.**

2. The children are so excited to eat out that they are unable to choose between a pizza a burger.
3. When asked to come to the party, Ramesh declined saying that he had decided to stay home and study instead.

- (a) with
- (b) or
- (c) and
- (d) for
- (e) in
- (f) at

- (A) acf

- (B) cbe
- (C) abf
- (D) dbe
- (E) abe

4. 1. The boy was hit _____ a stone.
2. He is writing _____ ink.
3. We discussed the matter _____ tea.
(a) with
(b) by
(c) over
(d) in
(e) on
(f) into

- (A) bde
- (B) adf
- (C) adc
- (D) def
- (E) bac

5. 1. He was sitting _____ his sister.
2. He distributed the toffees _____ us.
3. Butter is made _____ milk.
(a) beside
(b) besides
(c) between
(d) amongst
(e) from

(f) of

- (A) acf
- (B) ade
- (C) ace
- (D) bdf
- (E) bce

6. 1. You must abstain _____ alcohol.
2. There is no exception _____ the rule.
3. Your views don't accord _____ mine.

- (a) to
- (b) from
- (c) with
- (d) of
- (e) into
- (f) for

- (A) abc
- (B) bac
- (C) dac
- (D) dba
- (E) bcf

7. 1. Get _____ this bus. It goes to our destination.
2. She is standing _____ the car.
3. This material is different _____ that one.

- (a) by
- (b) on
- (c) from

(d) onto

(e) to

(f) in

(A) dbc

(B) fac

(C) bac

(D) bfe

(E) cde

8. 1. I knocked him _____ accidentally.
2. He goes to office _____ foot.
3. He is the boy who speaks _____ an accent.

(a) on

(b) with

(c) by

(d) over

(e) in

(f) from

(A) acb

(B) abc

(C) dab

(D) dcb

(E) caf

9. 1. He is _____ work.
2. Eighteen and _____ can watch this movie.
3. He made her feel special and cared _____.

(a) above

- (b) out of
- (c) after
- (d) on
- (e) for
- (f) in

- (A) fce
- (B) bcf
- (C) eca
- (D) bae
- (E) fce

10. 1. Following the registration of the two complaints, police placed Saeed _____ house arrest on Sunday.

2. The news channel reported that he had been selected _____ the seat.

3. The jail authorities stopped serving non-vegetarian food _____ inmates. (**Real NMAT Question**)

- (a) to
- (b) for
- (c) after
- (d) under
- (e) inside
- (f) besides

- (A) bfc
- (B) fbc
- (C) dba
- (D) abc
- (E) dce

11. 1. The official refused to comply _____ my request.
2. He could not go for a holiday for want _____ money.
3. He managed to gain insight _____ the working of the company barely within days of joining.
(a) to
(b) of
(c) in
(d) into
(e) with
(f) off
(A) dbf
(B) ebd
(C) adb
(D) fad
(E) efb
12. 1. Our army triumphed _____ the enemy.
2. She always sides _____ him whenever he and I argue.
3. Her comments were a slur _____ the staff at the hotel.
(a) to
(b) of
(c) in
(d) over
(e) with
(f) on
(A) dbf
(B) ebd

(C) adb

(D) def

(E) efb

13. 1. We flew down to Mumbai _____ the weekend.

2. _____ weekends, I like to watch football.

3. One _____ five will be called for an interview.

(a) on

(b) with

(c) by

(d) over

(e) in

(f) from

(A) acb

(B) abc

(C) dae

(D) dcb

(E) caf

14. 1. There is a large proportion of people who are not persuaded _____ his weight loss programme.

2. _____ the terms of the lease, you have no right to make any changes to the apartment.

3. I can't imagine what has come _____ him these days.

(a) over

(b) from

(c) under

(d) of

(e) into

(f) for

(A) abe

(B) bac

(C) dac

(D) dca

(E) bcf

15. 1. I want to buy that dress but I don't have my wallet _____ me.

2. He managed to get off _____ a light punishment.

3. There were at least five hundred people _____ the luxury yacht.

(a) to

(b) aboard

(c) with

(d) of

(e) into

(f) on

(A) fad

(B) bac

(C) dab

(D) dea

(E) fcb

16. 1. She splashed water _____ her face.

2. He ate two pizzas and she ate one, so _____ them they ate three pizzas.

3. I have to get these dollars changed _____ rupees.

(a) on

- (b) into
- (c) after
- (d) over
- (e) between
- (f) in

- (A) fce
- (B) aeb
- (C) eca
- (D) dae
- (E) def

17. 1. She was adamant that she would work _____ the night.

2. I prefer walking ____ driving.

3. She won't get the lead role as her age is _____ her.

- (a) to
- (b) in
- (c) beneath
- (d) behind
- (e) against
- (f) over

- (A) dbf
- (B) cfe
- (C) bae
- (D) fad
- (E) efb

18. 1. He is so transparent, it is possible to see _____ every ploy.

2. Paintings should be done in bright shades so that they may stand _____ more vividly.

3. She ran _____ all of the main points of her presentation in a few hours. (**Real NMAT Question**)

(a) into

(b) through

(c) behind

(d) up

(e) out

(f) across

(A) adb

(B) aeb

(C) bdb

(D) beb

(E) feb

19. 1. A problem exists when we become aware of the difference _____ the reality and our desires.

2. Individuals differ _____ one another in their ability to understand complex ideas.

3. IQ tests were mainly designed _____ identifying mentally challenged children. (**Real NMAT Question**)

(a) for

(b) from

(c) besides

(d) through

(e) towards

(f) between

(A) ceb

- (B) afd
- (C) fba
- (D) dac
- (E) fac

20. 1. Good management comprises an array _____ practices and experience.

2. You must focus _____ your objectives.

3. This is a serious matter and should not be pushed _____ the carpet. (**Real NMAT Question**)

- (a) at
- (b) of
- (c) in
- (d) on
- (e) under
- (f) although

- (A) adb
- (B) abd
- (C) bde
- (D) cde
- (E) acb

21. 1. The first credible signs _____ the presence of the snow leopard have been found in Uttarakhand.

2. The role of two senior bureaucrats came _____ the scanner.

3. Subsequent _____ the Court's orders, hearing on the issue has been initiated. (**Real NMAT Question**)

- (a) of

- (b) to
- (c) off
- (d) under
- (e) towards
- (f) beneath

- (A) adc
- (B) adb
- (C) bdc
- (D) fcd
- (E) cda

22. 1. Raj is waiting for his friend _____ the hospital.
2. Raj is _____ the hospital.
3. He is mad _____ cleanliness and hygiene. (**Real NMAT Question**)

- (a) in
- (b) on
- (c) at
- (d) into
- (e) about
- (f) over

- (A) abf
- (B) acf
- (C) adb
- (D) cde
- (E) cae

23. 1. The formation of a star is accompanied _____ the release of gas and dust.

2. Albert Einstein is often regarded _____ the father of modern physics.

3. A rainbow is a beautiful display _____ vibrant colours.

(Real NMAT Question)

(a) as

(b) by

(c) of

(d) from

(e) among

(f) through

(A) aed

(B) dfb

(C) bcd

(D) bac

(E) edf

24. 1. It was a tough victory to pull _____ but they did it with aplomb.

2. It was disheartening to watch as they proceeded to quarrel and fall _____ with one another.

3. It is doubtful that after such a setback they will ever manage to put _____ their differences and play together on the stage again.

(Real NMAT Question)

(a) out

(b) about

(c) up

(d) off

(e) aside

(f) since

(A) cae

(B) caf

(C) dbe

(D) dae

(E) baf

25. 1. He is in a hurry as he is leaving _____ Japan on the evening flight.

2. The road to perdition is paved _____ good intentions.

3. I have been working on this novel _____ many years now. (**Real NMAT Question**)

(a) through

(b) for

(c) to

(d) with

(e) by

(f) since

(A) bbc

(B) bdb

(C) bad

(D) bbe

(E) bbf

5. Sentence Completion

Each of the sentences below consists of one blank or two blanks. Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

1. While there is no doubt that Manchester City is _____ football team, whether they are able to perform to their _____ in the upcoming Premier League season remains to be seen.
(A) a boring.....talent
(B) a good.....detriment
(C) an average.....capability
(D) an excellent.....potential
(E) an upcoming.....spectators
2. Allergy to gluten has become surprisingly common in recent times. Even the products made by companies that do not use any gluten in their manufacturing process _____be considered completely _____since there is no guarantee that gluten will not be present in the raw materials that these companies use to make their products.
(A) cannot.....benign
(B) should.....unsafe
(C) will not.....vulnerable
(D) claim to.....harmless
(E) are not to.....inconspicuous
3. The findings of a recent study provide an interesting example of the process of natural selection—certain light coloured

animals living in environments that have been soot and other forms of pollution, eventually take on a darker colouration.

- (A) painted with
- (B) coloured with
- (C) satiated with
- (D) exposed to
- (E) whetted in

4. According to one point of view, it is not correct to use compassion as a _____ principle because it is based on the assumption that just because an animal is like me in certain aspects, it will be like me in some other aspects as well. _____, this is an erroneous means of proving identity because it ignores the various historical, cultural and other references that might have crept in. Just because an animal looks like us does not mean that it is actually like us.

- (A) a universal.....moreover
- (B) a discriminating.....furthermore
- (C) a subjective.....surprisingly
- (D) a contentious.....nonetheless
- (E) a differentiating.....however

5. Many items of clothing are worn purely for traditional or ceremonial purposes—because the occasion demands it. For example, the tie has no function that anyone can explain, yet most people working in a corporate environment would rarely be seen without one.

- (A) accepted
- (B) rational
- (C) critical
- (D) illogical

(E) peculiar

6. Laughing during the prayer meeting was a most _____ act _____ by him.
- (a) egregious, perpetrated
 - (B) inconspicuous, committed
 - (C) gross, inflicted
 - (D) flagrant, executed
 - (E) resplendent, wreaked
7. The vegetation here is quite _____ but the vegetation in the adjoining state is _____ making it a complete contrast.
- (a) luxuriant, sparse
 - (B) copious, profuse
 - (C) slender, sporadic
 - (D) scanty, exiguous
 - (E) bountiful, munificent
8. The old man wasn't aware that his son, of whose _____ he was completely _____ was the talk of the town because of his flirtatious ways.
- (a) turpitude, satisfied
 - (B) depravity, certain
 - (C) rectitude, convinced
 - (D) righteousness, coaxed
 - (E) morality, unassertive
9. Budget travellers and birdwatchers are content to plan their trips during the rainy season, when prices _____.
- (a) escalate

- (B) plummet
- (C) descend
- (D) abate
- (E) diminish

10. It is rather _____ of him to feel that he knows more about the topic than his teacher.

- (a) discourteous
- (B) uncouth
- (C) presumptuous
- (D) peremptory
- (E) arbitrary

11. The police officer cornered the _____ man to see if he was _____.

- (a) startled, restrained
- (B) staggering, inebriated
- (C) wobbly, despondent
- (D) rickety, intoxicated
- (E) fragile, sober

12. The _____ “pretty ugly” implies that a person can be both attractive and unattractive at the same time.

- (a) sarcasm
- (B) euphemism
- (C) oxymoron
- (D) antithesis
- (E) rhetoric

13. The teacher doubted the _____ of the student when he submitted a paper written by someone else.
- (a) veracity
 - (B) candour
 - (C) fidelity
 - (D) mendacity
 - (E) congruity
14. The road is quite _____ and one does feel a little _____ when driving through it.
- (a) meandering, bizarre
 - (B) discursive, giddy
 - (C) serpentine, light headed
 - (D) sinuous, surreal
 - (E) digressive, nauseous
15. The new evidence will, in all likelihood, _____ the _____ of the murder charge.
- (A) exonerate, gullible
 - (B) vindicate, defendant
 - (C) castigate, criminal
 - (D) censure, wrongdoer
 - (E) acquit, reprobate
16. Completely _____ to the fact that the students were bored, the Professor continued his _____ for three hours.
- (a) oblivious, harangue
 - (B) unheeding, rant
 - (C) indifferent, onslaught
 - (D) impervious, polemic

(E) impassive, panegyric

17. It's only when the underwater clown turns to face you that you understand why it's the most feared animal on Earth. From the front its head is no longer soft and jowly but _____ to an arrow that draws its black eyes into a _____ looking V. The _____ smile is gone, and all you see are rows of two-inch teeth capable of crunching down with almost two tons of force.

(a) diminishes, joyous, dazed
(B) contracts, quivering, cheeky
(C) stiffens, menacing, intimidating
(D) tapers, sinister, bemused
(E) subsides, threatening, indignant

18. The southern tip of Africa is more _____ than many give it credit for: a spectacular blend of game-spotting safaris, _____ of ancient cultures and _____ landscapes ranging from widescreen dusty plains to thundering waterfalls.

(A) distinct, traces, multitude
(B) disparate, vestige, profuse
(C) diverse, echoes, myriad
(D) distinguishable, memento, excessive
(E) different, reminder, riot

19. In telling the story of one of history's most celebrated _____, the sinking of the White Star Line's R.M.S. Titanic on her maiden voyage from Southampton on April 15, 1912, Cameron was clearly inspired by the challenge of reproducing the event with a physical _____ and impact _____ in the numerous previous film and TV versions of the event.

(a) tragedies, authenticity, conceivable

- (b) calamities, plausibility, ineffable
- (c) afflictions, chicanery, improbable
- (d) disasters, verisimilitude, inconceivable
- (e) tribulations, artfulness, unimaginable

20. Scientists have come up with a novel technique to detect paraffin oil _____ in coconut oil.

- (A) contamination
- (B) pollution
- (C) availability
- (D) mixture
- (E) besmirch

6 Analogies

Directions for Questions 1–5: Choose the word or pair of words that best completes the relationship to the given pair.

1. Crime : Police
 - (A) Watchman : Theft
 - (B) Food : Eat
 - (C) Weight : Exercise
 - (D) Flood : Dam
 - (E) Play : Football
2. Cleaver : Butcher
 - (A) Screwdriver : Mechanic
 - (B) Treadmill : Runner
 - (C) Pen : Writer
 - (D) Scalpel : Surgeon
 - (E) Brush : Painter
3. Captain : Ship
 - (A) Teacher : School
 - (B) Manager : Office
 - (C) Guide : Tourist
 - (D) Doctor : Hospital
 - (E) Hotel : Concierge
4. Dislike : Loathe
 - (A) Pain : Discomfort
 - (B) Coward : Foolhardy

- (C) Disquiet : Anxious
- (D) Fear : Stress
- (E) Joy : Ecstasy

5. Altruistic : Selfishness

- (A) Enlightened : Wisdom
- (B) Befuddled : Clarity
- (C) Flippant : Calm
- (D) Assiduous : Diligence
- (E) Depressed : Sorrow

Directions for Questions 6–17: Choose the pair of words that **does not** share the same relationship as the given pair.

6. Metal: Music

- (a) Expressionism: Painting
- (b) Risotto: Dish
- (c) Clarinet: Musical Instrument
- (d) Bolero: Dress
- (e) Cha Cha: Dance

7. Scrawny: Slim

- (a) Nitpicking: Meticulous
- (b) Shocking: Surprising
- (c) Miserly : Economical
- (d) Nosey : Inquisitive
- (e) Ludicrous : Absurd

8. Tiara: Hair

- (a) Muffler: Neck

- (b) Anklet: Ankle
- (c) Cravat: Neck
- (d) Girdle: Wrist
- (e) Sash: Waist

9. Paleontology: Fossils

- (a) Entomology: Insects
- (b) Seismology: Earthquakes
- (c) Petrology: Rocks
- (d) Anthropology: Mankind
- (e) Ornithology: Fish

10. Canto: Poem

- (a) Island: Archipelago
- (b) Piston: Engine
- (c) Canopy: Rain
- (d) Mast: Ship
- (e) Staircase: Building

11. Tepid: Boiling

- (a) Careful: Punctilious
- (b) Drizzle: Downpour
- (c) Like: Dote
- (d) Avaricious: Rapacious
- (e) Vain: Vainglorious

12. Denigrate: Belittle

- (a) Dearth: Scarcity
- (b) Ephemeral: Transitory

- (c) Ineptitude: Competence
- (d) Indolent: Lazy
- (e) Facile: Superficial

13. Mozzarella: Cheese

- (A) Spaghetti: Pasta
- (B) Moccasin: Dress
- (C) Macchiato: Coffee
- (D) Viper: Snake
- (E) Chrysanthemum: Flower

14. Quiver: Cobras

- (a) School: Fish
- (b) Congregation: Pigeons
- (c) Herd: Antelopes
- (d) Army: Caterpillars
- (e) Float: Crocodiles

15. Fit: Fiddle

- (a) Fresh: Daisy
- (b) Slippery: Eel
- (c) Straight: Arrow
- (d) Mad: Ox
- (e) Quiet: Church mouse

16. Brush: Bristle

- (a) Flower: Stamen
- (b) Fruit: Pericarp
- (c) Aircraft: Fuselage

- (d) Billboard: Awning
- (e) Symphony Orchestra: Woodwinds

17. Address: Location

- (A) Annul: Abrogate
- (B) Bark: Snap
- (C) Mean: Generous
- (D) Die: Expire
- (E) Current: Present

Directions for Questions 18–25: Find out the pair of words that has the same relationship as the original pair.

18. Kind: Benevolent (*Real NMAT Question*)

- (A) Empty: Full
- (B) Blemish: Loyalty
- (C) Absurd: Rational
- (D) Stubborn: Obstinate
- (E) Capricious: Unchanging

19. Mollusc: Shell

- (A) Lemon: Rind
- (B) Marshmallow: Confection
- (C) Orange: Citrus
- (D) Rose: Rosa
- (E) Chocolate: Edible

20. Hedonism: Pleasure

- (A) Asceticism: Self-indulgence
- (B) Altruism: Selfishness

- (C) Sexism: Equality
- (D) Eidolism: Ghosts
- (E) Nihilism: Absolute power

21. Basil: Herb

- (a) Ragdoll: Cat
- (b) Frigate: Aircraft
- (c) Alaskan Husky: Fox
- (d) Marmot: Squirrel
- (e) Equine: Horse

22. Disheveled: Tidy

- (A) Disdain : Contempt
- (B) Discrepancy: Affront
- (C) Kindle: Ignite
- (D) Dispel: Dissipate
- (E) Exasperate: Please

23. Trickle: Gush

- (a) Plunder: Pillage
- (b) Quash: Revoke
- (c) Breeze: Gale
- (d) Acorn: Oak tree
- (e) Tide: Ebb

24. Trepidation: Trembling

- (a) Earthquake: Tsunami
- (b) Snowflakes: Deluge
- (c) Acquittal: Incarceration

- (d) Cold: Scald
- (e) Sickness: Affliction

25. Bread: Grain (***Real NMAT Question***)

- (A) Many: Berries
- (B) Drink: Alcohol
- (C) Hot: Beverage
- (D) Fruit: Grapes
- (E) Wine: Fruit

5.2 Answers and Explanations

The following discussion on answers and explanations is intended to familiarise you with the most efficient and effective approaches to these kinds of questions. Remember that it is the problem solving strategy that is important, not the specific details of a particular question.

1 Reading Comprehension

Passage 1

Topic—Mediums for job advertisements

Scope—Different media used to advertise a firm's employment needs

Passage Map

P 1—Importance of choosing a particular medium for advertising jobs

P 2—Newspaper advertisements for jobs

P 3—Effects and popularity of newspapers for job advertisements

P 4—Advertising in journals and trade professionals – Pros

P 5—Advertising in journals and trade professionals – Cons

1. (A) This is incorrect as the passage doesn't focus on primary channels of advertising job but mentions just two channels.
(B) This is negated as the passage doesn't mention the various aspects of jobs but the kind of people who can be reached by a particular channel.
(C) This is mentioned but it is not the main idea of the passage.
(D) This is misleading as the passage talks of 'extensive use of newspaper advertising in recruiting' but not of the importance of job advertisements in newspapers.
(E) The passage talks of different media used to advertise a firm's employment needs. It talks of pros and cons of advertising for jobs in newspapers and trade journals with the focus that a firm should select a media for job advertising based on the kind of vacancies that need to be advertised.

The correct answer is E.

2. (A) This is incorrect because just because there are other options available doesn't make newspaper advertising a

risky proposition.

- (B) This is negated because the passage doesn't talk of the interest of the employees already working in an organisation.
- (C) This mentions incorrect projection of a company which is not referred to in the passage.
- (D) This is skewed as the passage talks of higher chances of poor selection which only suggests that the chances of making a correct selection of the vacancy would be lesser but not rarer, in certain cases.
- (E) Please refer to lines, "Such advertisements generate a vast number of candidates most of whom aren't qualified, and these inquiries are costly to process. This situation increases the likelihood of poor selection decisions." This supports option (E), making it the correct answer.

The correct answer is E.

3. (A) Incorrect as the tone of the passage is neither positive nor negative.
- (B) Incorrect as the tone of the passage is neither positive nor negative.
- (C) The author talks of analyzing the pros and cons of a media while choosing the most effective one and he goes on to explain the same. So, this is the correct answer.
- (D) Incorrect because the author doesn't subscribe to a particular media but stresses on the need for analysis.
- (E) Incorrect as the tone of the passage is neither positive nor negative.

The correct answer is C.

4. (A) This is clearly mentioned in the last para of the passage.
- (B) This can be inferred from the first para of the passage.
- (C) This is the correct manner because the passage clearly states that newspaper advertising is extensively used in recruiting.
- (D) This is mentioned in the second para.
- (E) This is also mentioned as the first line in the third para.

The correct answer is C.

Passage 2

Topic—Author's intention in a text or poem

Scope—Whether the intention of the author actually comes through in a text

Passage Map

P 1—Provides an introduction to Wimsatt and Beardsley and their point of view

P 2—Provides one argument of Wimsatt and Beardsley

P 3—Provides another argument put forward by Wimsatt and Beardsley

P 4—Describes Wimsatt and Beardsley's point of view on the matter

1. (A) The author talks about it in Para1 but this is not what the passage is primarily concerned with.
(B) B summarises our thought in the topic and scope defined earlier in the best manner and should be the correct answer.
(C) This has been talked about in the last Para but is definitely not the central theme.
(D) The author has discussed their ideas but has not talked about the significance of their ideas.
(E) This is one of the points discussed by the author but not the main theme.

The correct answer is B.

2. (A) This has been mentioned in the last Para.
(B) This has also been mentioned in the last Para.
(C) This is also mentioned in Para 2.
(D) Option D is not mentioned anywhere in the passage and so should be the correct answer.
(E) Mentioned in Para 2.

The correct answer is D.

3. (A) 'The author duo finds the design or intention of the author neither accessible nor desirable as a yardstick for judging the accomplishment of a literary text.' The author agrees with this statement.
- (B) 'Wimsatt and Beardsley conclude that a text is neither the critic's nor the author's. It is detached from the author at birth and goes about the world beyond his power of intention or ability to control it.' The author subscribes to this statement also.
- (C) This is also mentioned in Para 2.
- (D) The author actually states the opposite of C, as is clear in the last paragraph of the passage.
- (E) The author has stated this in Para 3.

The correct answer is D.

4. (A) This is not the correct interpretation of the statement.
- (B) This is also not the correct interpretation.
- (C) The entire point being made by the passage is that meaning of a poem or story is what the reader ascribes to it and not what the author intended.
- (D) Incorrect interpretation.
- (E) Not the correct option.

The correct answer is C.

Passage 3

Topic—What triggers human emotions?

Scope—To explore the relationship between impulses and release of certain emotions.

Passage Map

P 1—states that certain emotions are accompanied by the release of hormones and these emotions cannot be controlled by humans.

P 2—explains how the understanding of impulse triggers and impulse control can help curb sudden emotional outbursts.

1. (A) The author only states that the rate of dissipation of certain hormones is beyond the control of the conscious human mind and is silent whether it is or not within the control of the sub-conscious human mind. So, this option cannot be definitely true.
- (B) The author talks of a less impulsive approach to a situation as a smarter approach. Hence, he definitely feels that it is better to control our reactions and hence, our anger. Also, the author refers to anger as an unwanted impulse.
- (C) This option is incorrect because the passage only talks of certain emotion and not all physical reactions.
- (D) The passage talks of emotions that are triggered spontaneously but is silent on the other emotions. These may or may not be a result of calculated approach and hence, the option is incorrect.
- (E) In the last line of the first para, the author clearly mentions that when certain emotions are triggered, they can circumvent our conscious mind and hence, they are out of the control of our conscious mind.

The correct answer is B.

2. (A) Incorrect because, as the first paragraph clearly states, a person cannot consciously control the release or dissipation of his hormones.

- (B) The second paragraph starts by stating that a rational and a highly impulsive person may perceive the same event differently. Thus, B should be the answer.
- (C) Incorrect because, as the first paragraph clearly states, a person cannot consciously control the release or dissipation of his hormones.
- (D) Is a distortion of facts in the first paragraph.
- (E) Is the opposite of what the passage states.

The correct answer is B.

3. (A) Mislead means 'to urge/compel someone in the wrong direction'.
- (B) Misdemeanor means 'misconduct'.
- (C) Misguide means 'to provide wrong/faulty assistance to'.
- (D) Misinterpret means 'misunderstand', which is closest in meaning to 'misconstrue' as used here.
- (E) Misrepresent means 'to portray (any subject) incorrectly'.

The correct answer is D.

4. (A) Cannot be inferred.
- (B) Because the word 'unfortunately' provides a transition from the previous sentence, which talks about better emotional control, the next sentence mentions that, unfortunately, in several cases a human cannot have conscious control over his emotions. Thus, B is the best answer.
- (C) The definition of 'desired state of affairs' cannot be inferred from the information given within the passage.
- (D) No such 'efforts' made by researchers have been mentioned.

(E) Such a connection is not what follows the said statement.

The correct answer is B.

Passage 4

Topic—Grants by charitable foundations.

Scope—How charitable foundations keep a check on the grants they make to beneficiaries.

Passage Map

P 1—introduces the three stages in which charitable organisations keep a check on the use of their grants by beneficiaries.

P 2—explains the first stage and how the charitable organisation exercises control at this stage.

P 3—explains the second stage and how the charitable organisation exercises control at this stage.

P 4—explains the third stage and how the charitable organisation exercises control at this stage.

1. (A) The passage is not concerned with *why* it is imperative or important for charitable organisations to act in this manner. Rather, the passage focuses on how charitable organisations go about imposing this control.
- (B) There is no such ‘argument’ in the passage.
- (C) This does not cover misuse of funds.
- (D) The passage is clearly concerned with highlighting three different ways in which charitable foundations try to prevent or control the misuse of their funds by the beneficiaries of these funds. Thus, this is the correct answer.
- (E) This does not cover ‘control of funds’.

The correct answer is D.

2. (A) It is mentioned in the last paragraph.
- (B) It is mentioned in the 3rd paragraph.
- (C) It is mentioned in the 2nd paragraph.
- (D) The passage never states that charitable organisations act as mentors to their beneficiaries. They can act as or

appoint *monitors*, but *mentors* is not mentioned anywhere in the passage.

(E) It is mentioned in the 3rd paragraph.

The correct answer is D.

3. (A) According to the passage, one of the controlling mechanisms is to choose which type of expenses to reimburse. If the entity takes advance payment and doesn't share the details on the expenses, the organisation's control will be negatively affected.
- (B) According to the passage, the charitable organisation can define negative prohibitions, i.e., the kind of projects for which they will not invest.
- (C) An organisation maintains control by investing in a staggered fashion and hence, may choose not to pay all the money upfront.
- (D) A controlling mechanism is to appoint monitors who will work with the beneficiary throughout the project. If the monitors are appointed by the entity themselves, the efficiency of these monitors will be questionable. Hence, the organisation may choose not to invest with such an entity.
- (E) Whatever instructions or requirements a charitable organisation has need to be mentioned in the agreement up front before the money has been committed. The beneficiary is not obliged to follow any additional instructions that the charitable organisations may come up with later on.

The correct answer is E.

4. (A) Secrecy means 'furtiveness'.
- (B) Responsibility means 'ownership'.

- (C) Authority is closest in meaning to 'discretion' or 'choice'.
- (D) Credibility means 'trustworthiness'.
- (E) Gullibility means 'pliability'.

The correct answer is C.

Passage 5

Topic—The *Guinness Book of World Records*.

Scope—The beginning of record taking and how the nature of records has changed over the years with reference to the *Guinness Book*.

Passage Map

P 1—To provide an introduction to the Guinness Book.

P 2—To discuss the approach of the initial record collectors (with reference to the *Guinness Book*).

P 3—To discuss the *Guinness Book* in its current form and how the nature of records contained in it has changed from its earlier forms.

P 4—To provide a conclusion by stating a possible useful role of the *Guinness Book* in the future.

1. The author clearly has a neutral-to-positive tone in the passage, so all the options that contain negative terms, such as 'criticise', can be eliminated. The passage starts by discussing the origins of the *Guinness Book* and goes on to discuss the changes that have come about in the book as it has evolved over the years. Note that the last paragraph ends on a positive note, further reinforcing the decision to eliminate all options with negative connotations.
 - (A) Conveys the main idea of the passage best and is the correct answer.
 - (B) The author never criticises anything in the passage.
 - (C) The author does much more than just explain the origin of the book.
 - (D) While the passage does mention this fact in passing, this is not why the author wrote the entire passage.
 - (E) The first part of this option about the origin of the book is correct, but the second part which states that the author advocates against something is obviously incorrect.

The correct answer is A.

2. While all the options contain elements mentioned in the passage, most of them distort these elements. (B) states what is stated in the passage verbatim and is the correct answer.
- (A) The record is for the world's most powerful (and not the largest) combustion system.
 - (B) Mentioned in the 3rd paragraph.
 - (C) Incomplete. The record is for the world's heaviest train to be pulled with a beard.
 - (D) The passage never states that this record is actually there in the Guinness Book; it only states that the likelihood of this fact being in the book is high.
 - (E) Distortion. The record is for the world's heaviest train to be pulled by a beard and not for the world's strongest beard.

The correct answer is B.

3. (A) While this is true, the difference has to be in the content and not in the presentation.
- (B) The author clearly states in the second paragraph that, in the current version of the book, entertainment-oriented records share space with education-oriented ones. (B) states this best and is the correct answer.
 - (C) While this is also true, this is not necessarily a point of difference between the two versions of the book, as this was probably true for the older version as well.
 - (D) The author never states that the focus of the book has shifted; he merely states that the book now also contains entertainment-oriented facts.
 - (E) Same as (C).

The correct answer is B.

4. The purpose of the question is to find a word similar in meaning to that of the given word. In other words, one has to locate the synonym of Incarnation. 'Incarnation' means a particular physical form or condition of something or someone that is changing or developing.
- (A) Correct. 'Embodiment' which means a tangible or visible form of an idea, quality or feeling, is the closest synonym.
 - (B) 'Incorporeal' means having no physical or tangible form. This is an antonym of the given word
 - (C) 'Ability' refers to the capacity or skill to do something. This is not related to the given word and can be negated.
 - (D) 'Computerised' means to perform processes or operations by means of a computer. This is also unrelated to the given word.
 - (E) 'Epitome' refers to a person or thing that is a perfect example of a particular quality or type. Though this is a synonym for 'incarnation', its use is contextually inappropriate here.

The correct answer is A.

Passage 6

Topic—Tycho Brahe

Scope—Tycho Brahe's contribution to astronomy.

Passage Map

P 1—To provide an introduction to Tycho Brahe.

P 2—To discuss Tycho's focus on accuracy.

P 3—To discuss some of Tycho's work and achievements.

P 4—To state how Tycho dispelled a popular belief held at that time.

P 5—To discuss the connection between Tycho's and Aristotelian Physics.

P 6—To highlight Tycho's contribution to modern astronomy.

1. (A) It does not speak of Tycho.
(B) It focuses more on Aristotle than Tycho.
(C) The entire passage talks about how Tycho's work paved the way for modern astronomy. This option states this best and is the correct answer.
(D) Doesn't mention Tycho.
(E) Doesn't highlight the lasting impact of Tycho's work.

The correct answer is C.

2. (A) The 5th paragraph mentions that Tycho could not ignore Aristotelian Physics, and hence if this option was true, it would not weaken the argument.
(B) The existence of various theories related to astronomy in the sixteenth century supports this option.
(C) There is no argument in the passage that would be weakened if this option was true.
(D) Nothing in the passage supports the fact that Ptolemaic system was more accepted while the Copernican model

was rejected. In fact, the passage mentions that Tycho, to some measure, supported the theory proposed by Copernicus, and the Tychonic world system provided a middle ground between the Copernican models and Ptolemaic models. If at all the Ptolemaic system was more accepted while the Copernican model was rejected, it would indicate that Tycho's theories were based on a rejected theory, and hence could not become popular.

- (E) There is no argument in the passage that would be weakened if this option was true.

The correct answer is D.

3. (A) Mentioned in the second paragraph.
(B) While the passage mentions Kepler, who was Tycho's assistant, once at the end of the second paragraph, it never goes into the details (or even mentions the work) of his other assistants or their achievements, this is the correct answer.
(C) Mentioned in the first paragraph.
(D) Mentioned in the fifth paragraph.
(E) Mentioned in the fifth paragraph.

The correct answer is B.

4. (A) Cynical means 'disbelieving'. Hence not true.
(B) Mocking means 'jeering'. Hence not true.
(C) Supportive implies 'endorsing'. The author definitely views Tycho Brahe positively. Hence true.
(D) Ambivalent means 'uncertain/lacking opinion'. Hence not true.
(E) Pessimistic means 'negative/lacking optimism'. Hence not true.

The correct answer is C.

Passage 7

Topic—Fingerprint records.

Scope—The criminal and civil uses of fingerprint records and how fingerprint impressions can be taken.

Passage Map

P 1—To state the importance/uses of maintaining fingerprint records.

P 2—To describe the civil uses of fingerprint records which are often overlooked in favour of the criminal uses.

P 3—To describe the actual mechanics of how fingerprints are formed and how fingerprint impressions can be taken.

1. (A) This is the purpose of the entire paragraph and not just of this sentence.
(B) Same as A.
(C) This is the literal meaning of the sentence, but we need to answer why the author is stating this fact.
(D) The question is asking you for the role of the sentence, that is, why did the author put this sentence in this paragraph? Since this is a function question, you need to answer for the 'why' and not the 'what'. Note that the sentence starts with the term 'however', which immediately implies that it is trying to show a contrast with the previous statement. The previous statement states that the lay mind associates fingerprints with being useful primarily in criminal investigation. The second sentence then creates the contrast by stating that this is not the case and that, in fact, there are more fingerprints in the Civil File of the FBI than in the Criminal File; thereby implying that fingerprints probably have a more important or an equally important role outside of criminal investigation as well. Thus, the function of this sentence is to create this contrast between the two roles of fingerprints. (D) brings this out best and is the correct answer.
(E) Same as A.

The correct answer is D.

Note that in such questions the wrong answer choices will typically provide you the answer for the entire paragraph and not for the specific sentence or they will paraphrase the sentence in question, that is, answer 'what' rather than 'why'.

2. (A) While common sense dictates that this may very well be the case, there is nothing in the passage to suggest this.
- (B) The second paragraph states that this is not the case and that, in fact, the opposite may be true.
- (C) Extreme option. We know that this is a very important way, but we do not know whether this is the most foolproof way. There could always be a better way.
- (D) The first paragraph clearly states that the use of fingerprint records results in the imposition of more equitable sentences by the judiciary. (D) states this almost verbatim and is the correct answer.
- (E) According to the latter half of the third paragraph, the opposite may actually be true.

The correct answer is D.

3. (A) The author is explaining a process which is already in place; so, he is not explaining or justifying the 'need' as such.
- (B) The passage refers to him as the greatest instructor of the nineteenth century but not as the best British author of the nineteenth century.
- (C) The passage clearly states that Great Expectations is the greatest work of Dickens. Hence, this option is incorrect.
- (D) The passage doesn't define Dickens' writing as sarcastic at any point.

The correct answer is E.

4. (A) Inferred from the third paragraph.
(B) Inferred from the third paragraph.
(C) Inferred from the third paragraph.
(D) Towards the end of the third paragraph, wax is mentioned as one of the probable mediums or backgrounds on which one can take fingerprints and not the substance that actually needs to be applied on the fingers. Hence, (D) is the correct answer.
(E) Inferred from the third paragraph by the use of 'saline substance emitted from the glands'.

The correct answer is D.

Passage 8

Topic—Cancer

Scope—The connection between genes and cancer.

Passage Map

P 1—Asks questions pertinent to cancer

P 2—Describes the types of cancer

P 3—Explains how a normal cell transforms into a cancerous cell

P 4—Gives one reason how our genes may help prevent or indirectly cause cancer

1. (A) This has not been discussed.
(B) B summarises the central idea identified by us in our topic and scope best and should be the correct answer.
(C) The author has not touched upon this topic.
(D) This has also not been discussed.
(E) The author has talked about this in Para 2 but it is not the central idea.

The correct answer is B.

2. (A) Not mentioned.
(B) Not mentioned.
(C) Not the correct option.
(D) Not mentioned
(E) The answer is clearly provided in the last two sentences of the passage—‘Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate’.

The correct answer is E.

3. (A) The author does not say that it is only genes that cause cancer. There could be other ways of developing cancer

as well. This can be negated.

- (B) Neoplasm is an abnormal cell mass that develops when the controls of the cell cycle and cell division malfunction. However, all neoplasms are not cancerous. This can also be rejected.
- (C) Not mentioned.
- (D) This can be concluded from our reading of the passage especially the last paragraph. This cannot be denied or falsified making it the correct option.
- (E) Not mentioned.

The correct answer is D.

4. (A) 'Benign neoplasms do not spread, and are always seen to be local affairs. They are usually surrounded by a capsule and grow slowly, seldom killing their hosts if they are removed before they affect vital organs.' The author certainly agrees with this statement
- (B) Option B is clearly contradicted by the following sentence in the third paragraph—"It must also be stated here that it takes much more than just one mutation to change a normal cell into a full-fledged cancer cell." Thus, the author will not agree with option B.
- (C) 'Usually carcinogens are eliminated by the immune system or certain enzymes'. The author agrees with this statement as well.
- (D) 'It is well known that cancer-causing elements or carcinogens can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine). All of these have one common factor—all of them cause mutations, which are changes in DNA that alter the expressions of certain genes'. This is also negated as it is supported by the author.

- (E) 'It is well known that cancer-causing elements or carcinogens can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine)'. This has also been mentioned in the passage.

The correct answer is B.

Passage 9

Topic—Turtle walk

Scope—To describe the turtle walk and highlight its importance.

Passage Map

P 1—To provide an introduction to turtle walk.

P 2—To provide some details about Olive Ridley turtles.

P 3—To describe the actual turtle walk process.

P 4—To share the experiences of volunteers who participated in the event.

P 5—To conclude that despite minor hiccups, the turtles are thriving in this region.

1. (A) There is no sadness/gloom in the overall tone.
(B) There is no cheer or happiness in the overall tone.
(C) The tone is informal. But not predominantly so.
(D) The tone of the passage is descriptive as things like the turtles nests, what the baby turtles look like when they are first born, the activities of the volunteers are all described in detail throughout the passage.
(E) The passage is not making/breaking any particular claim. Thereby 'non-committal' does not fit here.

The correct answer is D.

2. (A) Option A is mentioned in paragraph one.
(B) Option B is mentioned in the final paragraph.
(C) Option C is mentioned in the third paragraph.
(D) Option D is mentioned in the fourth paragraph.
(E) Option E is not mentioned in the text.

The correct answer is E.

3. (A) Option A is correct as the passage is all about arribadas/nesting.
- (B) Option B is mentioned in paragraph three.
- (C) Option C is discussed in paragraph two which states there are two species.
- (D) Option D is described in paragraph three.
- (E) Option E is discussed in the final paragraph.

The correct answer is A.

4. (A) Option A is mentioned in the third paragraph.
- (B) Option B is mentioned in the penultimate paragraph.
- (C) Option C is described in the final paragraph.
- (D) Option D is mentioned in paragraph two.
- (E) Option E is not mentioned in the passage.

The correct answer is E.

Passage 10

Topic—The life and works of Charles Dickens

Scope—The early life of Dickens, his motivation for writing, his style of writing, his success and his end.

Passage Map

P 1—To introduce Dickens and the simplicity in his writings.

P 2 and **P 3**—To describe how in spite of criticism from some quarters, he was hailed as the greatest instructor of the nineteenth century.

P 4—To provide an insight into Dickens' early life and how it influenced his works.

P 5—To talk about the beginning of Dickens' literary journey and his overwhelming success.

P 6—To describe Dickens' criticism of American culture in his writing.

P 7—To talk about his favourite novel which was kind of an autobiography.

P 8—To talk about the tragedies in his life, his further writings and to conclude with his death.

1. (A) Dickens says in Para 4 that he felt orphaned and betrayed by his parents who did not take care of him.
(B) Dickens wrote *American Notes for General Circulation*, a sarcastic travelogue criticising American culture and materialism.
(C) The unparalleled sentimentality, rage, plight and bitterness in his novels established Dickens as a spokesman for the downtrodden.
(D) To some critics, Dickens was an entertainer and his novels lacked intellectual challenge, but the *London Times* described the British author as the greatest instructor of the nineteenth century in his obituary.

- (E) Correct. He returned to his original style with *A Tale of Two Cities* in 1859, a historical novel, followed by *Great Expectations* in 1861, widely considered his greatest literary feat.

The correct answer is E.

2. (A) A few of his characters have been mentioned but that is not what the passage is primarily concerned with.
- (B) The author talks about it but that is not the central theme.
- (C) The author has devoted one paragraph to this but this is not the main idea.
- (D) The passage is predominantly devoted to his writing and not his life story.
- (E) The passage focuses on the influences on his writing, his motivation for writing, his style of writing, etc and so option E is the best answer.

The correct answer is E.

3. (A) The second paragraph states that 'his works invariably aimed to influence the consciousness of his readers'.
- (B) The passage refers to him as the greatest instructor of the nineteenth century but not as the best British author of the nineteenth century.
- (C) The passage clearly states that *Great Expectations* is the greatest work of Dickens. Hence, this option is incorrect.
- (D) The passage doesn't define Dickens' writing as sarcastic at any point.
- (E) A couple of his novels were based on his childhood experiences but not all.

The correct answer is A.

4. (A) The author supports this view in Para 4.
(B) This has also been stated by the author in Para 1.
(C) The author definitely supports this.
(D) The author supports the view that these novels were developed from Dickens' life experiences.
(E) If this statement were to be true, it would negate the information provided in the passage.

The correct answer is E.

Passage 11

Topic—Computer simulations

Scope—The benefits of computer simulations, their types and their usefulness in analysing hypothetical situations.

Passage Map

P 1—To introduce computer simulations and their need.

P 2—To exemplify the uses of computer simulations.

P 3—To explain different types of simulation models.

P 4—To show the usefulness of computer simulations in ‘what if’ scenarios.

1. (A) Incorrect. The author discusses the uses of computer simulations.
(B) Correct. The author uses this passage to introduce simulations, discuss their uses and advantages.
(C) The primary purpose of the passage is to discuss the benefits of computer simulation and not outline its history.
(D) The author only talks about the advantages. Disadvantages are not mentioned in the passage.
(E) The passage does not focus on one particular application of simulation.

The correct answer is B.

2. (A) This cannot be inferred.
(B) This can also be negated.
(C) Correct. The author shows appreciation for and maintains a positive tone about computer simulations.
(D) This option can be rejected as there is no distrust in the author’s tone.
(E) There is no scepticism in the author’s tone.

The correct answer is C.

3. (A) This has been mentioned.
(B) This has also been mentioned in Para 3.
(C) Correct. The author clearly states that “what if” or hypothetical scenarios can be studied by using computer simulations.
(D) Mentioned in Para 2.
(E) Mentioned in Para 2.

The correct answer is C.

4. (A) Incorrect option.
(B) The author does not sound circumspect or guarded anywhere.
(C) The author has maintained a positive tone throughout the passage.
(D) D is the correct option as can be seen in the last line of the first paragraph.
(E) This is opposite of the view expressed by the author.

The correct answer is D.

Passage 12

Topic—Regulatory policy making

Scope—Discusses the ‘theory of incentives’ proposed by Charles L. Schultze and the view of its critics.

Passage Map

P 1—Introduces the concept of using regulatory policies in maneuvering social goals.

P 2—Introduces Schultze and tells us that he doesn't fully agree with the efficacy of the current system.

P 3—Tells us what Schultze's theory of incentives is.

P 4—Tells us what critics of Schultze's theory think.

1. (A) Option A is incorrect as it covers only the first paragraph and not the rest of the passage.
- (B) Option B is incorrect as Schultze does not mention the cons of his theory.
- (C) Option C is incorrect as it is not discussed in the passage.
- (D) Option D summarises this passage the best and should be the correct answer. The primary purpose question can only be answered correctly if you are able to identify the main idea being espoused by the author. In the passage, the author is simply propositioning Schultze's theory of incentives and the way this theory has been received by others.
- (E) Option E is incorrect because the author does not discuss social behaviors.

The correct answer is option D.

2. (A) Option A is incorrect as Schultze doesn't speak of the limitations of his theory.
- (B) Option B is incorrect as Schlutze proposes a new theory but says nothing about the current exercise of authority by said associations.

- (C) Option C is incorrect as it mentions regulation but not incentivisation.
- (D) Option D is incorrect as it is too specific.
- (E) Option E is correct. It is the crux of Schultze's theory. Refer the lines, *"Incentives, Schultze argues, use market-like strategies to regulate industry. They are, he claims, more effective and efficient than command-and-control regulation."*

The correct answer is option E.

- 3.
- (A) Option A is incorrect as it doesn't mention the role of incentives/Schultze's theory.
 - (B) Option B is incorrect as it is Schlutze's opinion and not the author's.
 - (C) Option C is incorrect as the ways in which the said behavior can be achieved is not mentioned.
 - (D) Option D is correct as it captures the author's viewpoint on the subject.
 - (E) Option E is incorrect as acceptance of Schultze's theory has not been mentioned in the passage.

The correct answer is option D.

- 4.
- (A) Option A is incorrect as it is mentioned in the passage. Refer the lines, *"The government could even provide incentives in the form of rewards for such socially valuable behaviour as developing technology to reduce pollution."*
 - (B) Option B is incorrect as it is mentioned in the passage. Refer the lines, *"The government could even provide incentives in the form of rewards for such socially valuable behaviour as developing technology to reduce pollution."*

- (C) Option C is correct as it is not discussed or even mentioned in the passage.
- (D) Option D is incorrect as it is mentioned in the passage. This can be concluded from the first paragraph.
- (E) Option E is incorrect as it is mentioned in the passage. Refer the lines, *“The government tells business how to reach certain goals, checks that these commands are followed, and punishes offenders.”*

The correct answer is option C.

Passage 13

Topic—Cancer

Scope—The connection between genes and cancer.

Passage Map

P 1—The connection between genes and cancer.

P 2—Describes the types of cancer.

P 3—Explains how a normal cell transforms into a cancerous cell.

P 4—Gives one reason how our genes may help prevent or indirectly cause cancer.

1. (A) This has not been discussed.
(B) B summarises the central idea identified by us in our topic and scope best and should be the correct answer.
(C) The author has not touched upon this topic.
(D) This has also not been discussed.
(E) The author has talked about this in Para 2 but it is not the central idea.

The correct answer is B.

2. (A) Not mentioned.
(B) Not mentioned.
(C) Not the correct option.
(D) Not mentioned
(E) The answer is clearly provided in the last two sentences of the passage—‘Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate’.

The correct answer is E.

3. (A) The author does not say that it is only genes *that cause cancer*. *There could be other ways of developing cancer*

as well. This can be negated.

- (B) Neoplasm is an abnormal cell mass that develops when the controls of the cell cycle and cell division malfunction. However, all neoplasms are not cancerous. This can also be rejected.
- (C) Not mentioned.
- (D) This can be concluded from our reading of the passage especially the last paragraph. This cannot be denied or falsified making it the correct option.
- (E) Not mentioned.

The correct answer is D.

4. (A) '*Benign* neoplasms do not spread, and are always seen to be local affairs. They are usually surrounded by a capsule and grow slowly, seldom killing their hosts if they are removed before they affect vital organs.' The author certainly agrees with this statement
- (B) Option B is clearly contradicted by the following sentence in the third paragraph—"It must also be stated here that it takes much more than just one mutation to change a normal cell into a full-fledged cancer cell." Thus, the author will not agree with option B.
- (C) 'Usually carcinogens are eliminated by the immune system or certain enzymes'. The author agrees with this statement as well.
- (D) 'It is well known that cancer-causing elements or carcinogens can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine). All of these have one common factor—all of them cause mutations, which are changes in DNA that alter the expressions of certain genes'. This is also negated as it is supported by the author.

- (E) 'It is well known that cancer-causing elements or carcinogens can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine)'. This has also been mentioned in the passage.

The correct answer is B.

Passage 14

Topic—Disability

Scope—*Discussing the various aspects of disability – its impact and cause*

Passage Map

P 1—Introduces the subject of increasing number of disabled people in the world.

P 2—Discusses the role of ageing and chronic health conditions.

P 3—Highlights the economic disadvantages that disabilities entail.

P 4—Highlights the social disadvantages that disabilities entail.

P 5—Discusses the ostracization faced by disabled people with respect to employment opportunities.

P 6—Discusses the perceptions regarding disabled people – especially among their caregivers.

P 7—Discusses the lack of civic support for the disabled.

P 8—Highlights the ostracization faced by both children and adults with disabilities.

P 9—Provides data on how the disabled are grossly ill-treated.

P 10—States that the disabled suffer from a lack of basic civic amenities.

P 11—Presents the lack of data available to gauge the number and condition of the disabled.

1. (A) Option A is incorrect as it is mentioned in the passage. Refer the lines, *“Of these, 110 million people (2.2%) have highly significant difficulties in normal functioning and 50% of the disabled cannot afford healthcare.”*
- (B) Option B is incorrect as it is mentioned in the passage. Refer the lines, *“Getting a fair idea of the numbers of people with disabilities and understanding their*

circumstances can help in removing disabling barriers and in facilitating people with disabilities to participate.”

- (C) Option C is incorrect as it is discussed in the passage. Refer the lines, “However, exclusive dependence on families can have adverse effect on caregivers, including stress, isolation and lost socioeconomic opportunities.”
- (D) Option D is incorrect as it is mentioned in the passage. Refer the lines, “.....two major reasons which account for higher prevalence of disability are ageing and rise in chronic health conditions such as diabetes, cardiovascular diseases and mental illness.”
- (E) Option E is correct as it is not mentioned in the passage.

The correct answer is option E.

- 2. (A) Though this statement has been made by the author, the topic of school education for children with disabilities has been discussed by the author to highlight larger systemic flaws.
- (B) Option B is incorrect as the author’s tone is not contentious at all. He is convinced of his perspective and has provided data and facts in support of his viewpoint.
- (C) The passage is talking about higher prevalence of disability among lower income countries. Also, it talks about disability rates in general and not specifically for children.
- (D) Refer the lines, *“In some countries the policies are either faulty or the resources allocated to implementing policies are often inadequate. For example, lack of financial incentive in education policy fails to motivate children with disabilities to attend school. In many regions of the world, misconceptions and prejudices*

affect the inclusion of children with disabilities in mainstream education and the progress of disabled employees in jobs.” This clearly shows that the author discusses this point to highlight the role played by bad policies and prejudices.

- (E) Option E is incorrect as the topic of discrimination is not a fresh introduction.

The correct answer is option D.

3. (A) Option A is incorrect as it speaks only of getting a job but discrimination impacts the promotion opportunities available to disabled people as well.
- (B) The statement in the passage only talks about a few countries. Refer the lines, *“The data in the Survey from four Southern African countries found that only 26–55% of people received the medical rehabilitation and 5–23% received the vocational training they needed.”*
- (C) Option C is incorrect as unemployment is not necessarily connected to lack of transport.
- (D) Option D is correct as the passage points out how they’re not let to join the workforce, let alone get ahead in their careers.
- (E) Option E is incorrect as it speaks only of men.

The correct answer is option D.

4. (A) It is mentioned in the last paragraph of the passage.
- (B) The passage states that misconceptions and prejudices affect the disabled but it is silent on the fact whether there is data corroborating this.
- (C) Option C is incorrect. The percentage reduction in the rate of employment is higher in case of disabled women than disabled men.

- (D) The passage talks of disability being more common in lower income countries than higher income countries. The passage doesn't talk of the increase in disability when comparing different income countries and hence, the option is incorrect.
- (E) The passage does talk of the four South-African countries but doesn't suggest if this sample is adequate or not for the remaining lower income countries.

The correct answer is option A.

2 Para Forming

1. Sentence (e) introduces a penal colony which is the subject of the passage, hence, making it the starting sentence. The only option to start with sentence (e) is option E, making it the correct answer.

The correct answer is E.

2. The entire paragraph is talking about the virus, so (d) should be a good starting sentence. (e) makes a logical connection with (d). Sentence (c) should come after sentence (a), since it is a logical progression of the thought mentioned in (a). Sentence (b) should be the last sentence of the paragraph.

The correct answer is C.

3. The entire paragraph is concerned with comparing life to a theatre performance. Thus, (b) should be a good starting sentence. (c) should come next because it provides an example of the *scholars* mentioned in (b). (a) makes sense after (c) and (d) should then come at the end.

The correct answer is E.

4. The entire paragraph is talking about self-driving cars, so (a) should be a good starting sentence. Then things get a little tricky because (b) and (c) both look good as the second sentence. However, if you read these two sentences in the order (cb), you will realise that it does not make any sense because the two sentences are talking about different things. Reading these two sentences as (bc), however, works because of the transition word 'moreover' that connects these two sentences. So, (bc) it should be with (d) coming at the end.

The correct answer is D.

5. The whole paragraph is concerned with dopamine and rewards, making (b) a good starting sentence. (a) needs to come next since it is also talking about the *reward* system. d-c then make a logical pair, because the 'he' in (c) refers to the 'Berridge' in (d).

The correct answer is B.

6. The whole paragraph is concerned with McConnell, so (d) should be a good starting sentence. (a) should come next followed by (e). b-c then form a logical pair, since (c) further builds on the personality of McConnell described in (b).

The correct answer is C.

7. Here, (d) and (a) form a logical pair since the band in (a) is introduced in (d). (e) needs to come after (c), since (c) introduces the Great Barrier Reef. The only question then is where should (b) come—after (c) or after (a). Note that there is no option that puts (b) immediately after (a). Hence, cbe is the correct order.

The correct answer is B.

8. The entire paragraph has to start from the invite from the sister. Thus, sentence (d) should be the first sentence. Sentence (e) gives the reason for sentence (c)—why the lady is making the trip alone.

The correct answer is E.

9. Sentences (a) and (c) both contain *this* that refers to companies having a stake in the health and fitness of their employees in sentence (a). Thus, sentences (c) and (d) both have to come after sentence (a), which brings us down to options (B) and (D). Between sentences (b) and (a), the

logical order is b-a since only then will the 'no wonder' in sentence (a) make sense. Thus, badc this option is the correct answer.

The correct answer is D.

10. (c) is an obvious start as it introduces the topic of deforestation. It will be followed by (d) which tells us how agriculture leads to deforestation. (b) will follow (d) as it further explains the process of deforestation. This is followed by (a) which tells us that logging operations for wood and paper products are another factor for deforestation.

The correct answer is B.

11. (b) is the most obvious start as it introduces the topic of internet being a great place for shopping. This eliminates all options except (B) and (C). (b) is followed by (d) and then (c) that elaborates the benefits of online shopping. Apart from competitive pricing, another advantage of online shopping is no shipping charge which is mentioned in (a).

The correct answer is B.

12. (d) is an obvious start as it introduces the topic of the mistake at the Oscars. (c) follows as it tells us what the mistake was. (a) and (b) follow as they discuss the Oscars' host talking about it on his show a day after the Oscars.

The correct answer is E.

13. (d) is the opening sentence as it introduces the topic of obesity in children. (c) will follow as it tells us about the findings of a study conducted on the topic. (a) and (b) are a mandatory pair as (a) talks about the health problems associated with obesity and (b) further tells us how these conditions lead to a decrease in the life span.

The correct answer is C.

14. (c) is the most obvious start as it introduces the topic of 'Walt Disney Company'. (d) will follow (c) as it tells us how 'Walt Disney' the 'high school dropout' founded his empire on fantasy and risk taking. This will be followed by (b) which further talks about how he created such a huge brand with his vision. (a) is obviously the closing sentence as it talks about the enormous legacy left by him.

The correct answer is B.

15. (a) is an obvious start as it introduces the topic of South Korea becoming a popular tourist destination. (d) follows it as it further talks about South Korea featuring on the top ten lists. (c) follows as it traces the reason for South Korea's rise after breaking from military dictatorship in the 80s. (b) further talks about how after the 80s hosting international events like an Olympics and a World Cup have made it a modern country.

The correct answer is E.

16. (b) is the opening sentence as it introduces the topic of Republican leaders breathing easy as the senators voted in favour of the debate. This is followed by (a) which talks about how the Republicans need to deal with issues within their party before the debate. (c) and (d) are a mandatory pair as (c) talks about time being important for Republicans and (d) elaborates it by stating the consequence of the bill not being passed that week.

The correct answer is D.

17. Sentence (c) talks of a particular situation which is mentioned to as 'this' in sentence (b). Also, both the sentences are in context of 'confining pressure'. Similarly, sentence (a) talks of

a way in which fractures occur or form which is referred to as 'this way' in sentence (d). Also, both the sentences talk of hydraulic fractures/fracturing. So, both cb and ad are mandatory pairs and this is present in only option A.

The correct answer is A.

18. (c) is the most evident start as it introduces the topic of 'cricket' and 'century' and (a) follows it as it further talks about the number of such centuries by great players. This is followed by (d) which talks about Tendulkar's great centuries and (b) obviously follows with pronouns 'his' and 'him' acting as clues.

The correct answer is B.

19. This jumble can be resolved with the help of chronology. (d) is the most evident start as it introduces the topic of Merce Cunningham's death and an open house being organised the day after his death. (b) will follow (d) as it gives us details as to the time and the number of dancers performing at the open house. (b) is followed by (c) which talks about Cunningham's assistant Robert Swinston giving a class in the master's style at the open house. (a) closes the paragraph by talking about how in the recent years Swinston and other senior dancers had been training students as the master was incapacitated by rheumatoid arthritis.

The correct answer is E.

20. (a) is the most obvious start as it introduces us to table manners by talking about using the left and the right hands to hold the fork and the knife respectively. This is followed by (c) which tells us how the fork and the knife are used. Next are (b) and (d) which tell us how the fork is held and used by itself without the knife.

The correct answer is B.

21. (c) is the most obvious start as it poses the question of the reason behind Holmes' captivating quality. (b) will definitely follow (c) as it talks about the answer to the question. (d) will follow (c) as it speaks about summarizing the life of Holmes' creator before answering the question in (c). The paragraph ends with (a) as it talks about Holmes' creator, Doyle.

The correct answer is B.

22. (d) is an obvious start as it opens the topic of the media trying to attract kids with advertisements. This is followed by (b) that takes the topic further and talks about the advertising industry viewing teenagers as a viable market option. The use of 'furthermore' and 'also' in option (a) connects it with option (c) by presenting a further expansion of the idea.

The correct answer is D.

23. 'ae' is a mandatory pair as both the sentences talk of two types of biopsy. Sentence (e) will come later because of the use of conjunction, 'but'. This mandatory pair is only available in option C, making it the correct answer.

The correct answer is C.

24. (a) is a logical pair since (a) describes the places mentioned in (d). This brings us to options (d) and (e). It doesn't make sense starting the paragraph with (c). The entire paragraph talks about glaciers. Thus, (d) should be the perfect starting sentence, making option E the correct answer.

The correct answer is E.

25. In the given paragraph, c-a form a logical pair as statement c makes a general statement and statement a provides a specific instance of the same. The use of 'however' in

statement d contrasts with statement b which presents an example where such a behavior was exhibited. This eliminates all options except option C.

The correct answer is C.

26. In this question statement (c) forms a logical pair with statement (d) as it provides an explanation for the claim made in the former. This eliminates all options except options B and E. Statements (b) and (a) also form a logical pair as it connects what is spoken now with what was spoken during his times. This makes cdabe the correct sequence.

The correct answer is E.

27. Statements (d) and (b) form a mandatory pair by establishing a time sequence between what we did a few years back and what we do now. However, this leaves us with three options- options A, B and D. Now (a) cannot be the opening sentence as it presents an advice/suggestion which can be done only after all the information has been discussed. If we look at statement (c) it contains the pronoun 'this free time' which can only refer to statement (b). This makes dbca the correct sequence.

The correct answer is B.

28. In this question, the statements b-d form a logical pair as the pronoun "it" in statement (d) refers to the "extents to appear unique" mentioned in statement (b). By the process of elimination, we are left with two options B and C. The use of "This, of course" in statement (c) makes it the concluding line and connects it with (a), making bdac the correct sequence.

The correct answer is B.

29. Sentence (e) introduces the topic and sentence (c) directly negates it, making ec a mandatory pair. So, options A, B and

E are negated. Sentence (d) explains the negation. ab is another mandatory pair as (a) gives an example of how an alternative therapy, that is, Chiropractic can be risky to the patients while (b) states that despite the risks, the patients are rarely informed about them. So, ecdba is the correct answer.

The correct answer is C.

- 30.** Statements (c) and (d) form a mandatory pair based on the chronological sequence of the years – 2013 and 2017. This eliminates options C and E. Sentence (a) has to be the opening sentence as it introduces the main idea being discussed-bees and pollination. Also, a-b form a mandatory pair because statement (b) talks about the problem being faced with respect to bees. This makes abcd the correct sequence.

The correct answer is A.

3 Identify the Error

1. The aim is to find the phrase which is making the given statement grammatically incorrect. The clue word in the given sentence is 'both'. The word 'both' vouches for two events or people like, 'both the boys...' or 'both Robin and Batman', etc. Keeping this in mind one may analyse the given sentence.

(A) 'to lose' is a grammatically correct expression.
(B) 'need to' is also required here
(C) Correct. 'Both' always takes 'and' and not 'as well as'.
(D) The adverb 'regularly' is required here.
(E) There is an error in C.

The correct answer is C.

2. The aim is to find the phrase which is making the given statement grammatically incorrect. We have two independent clauses here. Keeping this in mind one may analyse the given sentence.

(A) 'artist's most impressive' is a grammatically correct expression.
(B) 'have been produced' is also correct.
(C) Correct. 'New York, he moved there' contains an error. Since we have two independent clauses, they cannot be connected using a comma. We need to use a semi colon instead.
(D) 'native place, India'. This is also correctly used.
(E) There is an error in C.

The correct answer is C.

3. The aim is to find the phrase which is making the given statement grammatically incorrect. The verb in the second clause is not in the same form as the first. Keeping this in mind one may analyse the given sentence.
- (A) 'pursue their MBAs' is correct.
 - (B) 'completing college, while' is grammatically correct.
 - (C) Correct. 'working for' contains an error. 'Work for' is the correct form of the verb here.
 - (D) 'before seeking' is correctly used
 - (E) There is an error in C

The correct answer is C.

4. The aim is to find the phrase which is making the given statement grammatically incorrect. The correct relative pronoun has to be used. Keeping this in mind one may analyse the given sentence.
- (A) Correct. 'that is' is grammatically incorrect. The correct expression is 'who is'. We use 'who' for persons.
 - (B) 'for' is correctly used.
 - (C) 'is one of' is correct.
 - (D) 'most important clients' is also correct here.
 - (E) There is an error in A.

The correct answer is A.

5. The aim is to find the phrase which is making the given statement grammatically incorrect. 'Everyday' is an adjective and its use is incorrect here. Keeping this in mind one may analyse the given sentence.
- (A) 'Hoping' is correctly used.
 - (B) 'a permanent position' is also a correct expression.

- (C) 'put in' is also the correct phrasal verb.
- (D) Correct. 'everyday' is wrongly used here. We need to use the noun phrase 'every day' (with a space in the middle).
- (E) There is an error in D.

The correct answer is D.

6. The aim is to find the phrase which is making the given statement grammatically incorrect. The use of *although* and *yet* in the same sentence is redundant. Keeping this in mind one may analyse the given sentence.

- (A) 'studied' is correctly used here.
- (B) 'for the test' is also grammatically correct.
- (C) Correct. 'yet' is incorrect.
- (D) 'only manage' is correct.
- (E) There is an error in C.

The correct answer is C.

7. The aim is to find the phrase which is making the given statement grammatically incorrect. Parallelism has not been observed in the grammatical structure. Keeping this in mind one may analyse the given sentence.

- (A) 'large and barren' is correct.
- (B) 'is at once' is correctly used.
- (C) 'climatically harsh' is a grammatically correct expression.
- (D) Correct. 'the beauty of it is haunting' is incorrect. In order to maintain a parallel structure, the correct phrase should be 'hauntingly beautiful'.
- (E) There is an error in D.

The correct answer is D.

8. The aim is to find the phrase which is making the given statement grammatically incorrect. The verb in the second clause has to be in the simple past tense. Keeping this in mind one may analyse the given sentence.
- (A) 'met' is correct.
 - (B) 'for' is also correct.
 - (C) Correct. 'was thinking' is incorrectly used. We need to use 'thought' in its place. We do not need the past progressive tense 'was *thinking*' because the sentence is not talking about the ongoing nature of the activity.
 - (D) 'was' is correctly used as a helping verb in the past tense.
 - (E) There is an error in C.

The correct answer is C.

9. The aim is to find the phrase which is making the given statement grammatically incorrect. The sentence talks about an action that started in the past and is still carrying on. The usage of simple past and past perfect continuous is correct. Keeping this in mind one may analyse the given sentence.
- (A) 'started spewing' is correct
 - (B) 'and' as a connector is correct
 - (C) 'has been erupting' is also correct. Past perfect tense is used for an action still carrying on.
 - (D) 'ever since' is the correct usage.
 - (E) There is no error in the sentence.

The sentence is correct as written.

The correct answer is E.

- 10.** The aim is to find the phrase which is making the given statement grammatically incorrect. Since from is used before 'not only', it does not have to be used before 'but also'. Keeping this in mind one may analyse the given sentence.
- (A) 'items sourced' is correct.
 - (B) 'not only Asia' is correct.
 - (C) Correct. 'from' is incorrect. 'From' used before 'not only' takes care of the entire sentence.
 - (D) 'Central and Latin Americas' is correct.
 - (E) There is an error in C.

The correct answer is C.

- 11.** The aim is to find the phrase which is making the given statement grammatically incorrect. 'Items' should be compared to 'items' and not 'restaurant'. Keeping this in mind one may analyse the given sentence.
- (A) 'served in' is correct.
 - (B) 'are far more' is also correct.
 - (C) 'and delicious' is correct usage.
 - (D) Correct. 'your restaurant' is incorrect. 'The correct comparison should be *'than those served in your restaurant'*.
 - (E) There is an error in D.

The correct answer is D.

- 12.** The aim is to find the phrase which is making the given statement grammatically incorrect. The helping verb should be plural and not singular. Keeping this in mind one may analyse the given sentence.
- (A) Correct. 'there is' is incorrect. The correct verb to refer to a *large number of artefacts* should be the plural 'are'.

- (B) 'of artefacts from' is correct.
- (C) 'period, going' is also correct.
- (D) 'as' is correct usage.
- (E) There is an error in A.

The correct answer is A.

- 13.** The aim is to find the phrase which is making the given statement grammatically incorrect. The sentence is constructed correctly. Keeping this in mind one may analyse the given sentence.

- (A) 'as to which' is grammatically fine.
- (B) 'would prefer' is correct.
- (C) 'replied that' is also correct.
- (D) 'was fine' is correct construction.
- (E) There is no error in the sentence.

The correct answer is E.

- 14.** The aim is to find the phrase which is making the given statement grammatically incorrect, There is a subject-verb agreement error in the sentence. Keeping this in mind one may analyse the given sentence.

- (A) 'Each of the' is correct.
- (B) Correct. 'has a' should be used in place of 'have a'.
'Each of the' takes a plural noun and a singular verb.
- (C) 'narrate' is also correct.
- (D) 'about the crime' is correct as well.
- (E) There is an error in B.

The correct answer is B.

- 15.** The aim is to find the phrase which is making the given statement grammatically incorrect, The sentence has a redundancy error. Keeping this in mind one may analyse the given sentence.

(A)

Correct. 'Suppose' and 'if' mean the same and the use of 'if' is unnecessary.

(B) 'marooned' is used correctly.

(C) 'what would' is also correct.

(D) 'do' is correct as well.

(E) There is an error in A.

The correct answer is A.

- 16.** The aim is to find the phrase which is making the given statement grammatically incorrect, There are certain phrases that have a fixed usage. Keeping this in mind one may analyse the given sentence.

(A) 'both dancing and singing' is correct.

(B) 'refuses' is correct.

(C)

Correct. 'Conform to' should be used in place of 'conform by'. 'Conform to' is a fixed phrase which means comply with rules, standards, or laws.

(D) 'wishes of' is correct as well.

(E) There is an error in C.

The correct answer is C.

- 17.** The aim is to find the phrase which is making the given statement grammatically incorrect, There are certain words whose usage together is redundant. Keeping this in mind one may analyse the given sentence.

- (A) 'he heard' is correct.
- (B) 'father's accident' is correct.
- (C) Correct. 'Returned' means to 'come back'. The additional use of 'back' is unnecessary.
- (D) 'to his village' is correct as well.
- (E) There is an error in C.

The correct answer is C.

- 18.** The aim is to find the phrase which is making the given statement grammatically incorrect, There are certain nouns that retain their construction in the singular and plural forms. Keeping this in mind one may analyse the given sentence.

- (A) Correct. 'Innings' should be used in place of 'inning'. 'Innings' has an identical singular and plural form.
- (B) 'the match' is correct.
- (C) 'more interesting' is also correct.
- (D) 'second one' is correct as well.
- (E) There is an error in A.

The correct answer is A.

- 19.** The aim is to find the phrase which is making the given statement grammatically incorrect, A singular subject takes a singular verb. Keeping this in mind one may analyse the given sentence.

- (A) 'A major' is correct.
- (B) 'Maratha sculptors' is also correct.
- (C) Correct. 'were the creation' is incorrect. 'Was' should be used in place of 'were'. 'Contribution' is a singular subject that takes the singular verb 'was'.
- (D) 'the Buddha's' is correct.

(E) There is an error in C.

The correct answer is C.

20. The aim is to find the phrase which is making the given statement grammatically incorrect, The phrase 'one of the' takes a plural noun and a singular verb. Keeping this in mind one may analyse the given sentence.

(A) 'One of the' is correct.
(B) Correct. 'commit the guru' is the incorrect expression. 'Commits' should be used in place of commit.
(C) 'as well as' is correct.
(D) 'to celibacy' is also apt.
(E) There is an error in B

The correct answer is B.

21. The aim is to find the phrase which is making the given statement grammatically incorrect. The placement of the adjective is incorrect. Keeping this in mind one may analyse the given sentence.

(A) Correct. 'Retiring C.E.O' is the incorrect phrase. The correct construction should be 'soon to retire' or 'about to retire C.E.O'.
(B) 'asked his' is fine.
(C) 'interest' is correct.
(D) 'after his retirement' is also apt.
(E) There is an error in A

The correct answer is A.

22. The aim is to find the phrase which is making the given statement grammatically incorrect. The sentence has a

subject-verb agreement error. Keeping this in mind one may analyse the given sentence as:

- (A) *these*, is correct.
- (B) *stuffed*, is correct.
- (C) Since 'either' takes a singular verb, *are* should be replaced with "is".
- (D) *little*, is correct.
- (E) There is an error in C.

The correct answer is C.

- 23.** The aim is to find the phrase which is making the given statement grammatically incorrect. Keeping this in mind one may analyse the given sentence.

- (A) *paid for*, is correct.
- (B) *we need*, is correct.
- (C) *only take*, is correct.
- (D) *with us*, is correct.
- (E) This option is correct

The correct answer is E.

- 24.** The aim is to find the phrase which is making the given statement grammatically incorrect. The sentence has a subject-verb agreement error. Keeping this in mind one may analyse the given sentence.

- (A) *a common*, is correct.
- (B) *many a man*, is correct.
- (C) 'Many a' is a singular subject. Therefore, *have resigned* should be replaced with "has resigned".
- (D) *to fate*, is correct.
- (E) There is an error in C.

The correct answer is C.

25. The aim is to find the phrase which is making the given statement grammatically incorrect. Note that the article "*the*" is being used only once before politician and statesman. This means that only one person is being talked about. Keeping this in mind one may analyse the given sentence.
- (A) *his years*, is correct.
 - (B) *service to*, is correct.
 - (C) *and statesman*, is correct.
 - (D) Since the subject is singular, *were honoured*, should be replaced with "was honoured".
 - (E) There is an error in D.

The correct answer is D.

26. The aim is to find the phrase which is making the given statement grammatically incorrect. There is a tense consistency error in the sentence. Keeping this in mind one may analyse the given sentence.
- (A) *He has become*, is correct.
 - (B) *too old*, is correct.
 - (C) *it is*, is correct.
 - (D) Since the sentence is in present tense *looked after*, should be replaced by "looks after".
 - (E) There is an error in D.

The correct answer is D.

27. The aim is to find the phrase which is making the given statement grammatically incorrect. The given sentence appears grammatically correct. Keeping this in mind one may analyse the given sentence.

- (A) *A representative*, is correct.
- (B) *provide the students*, is correct.
- (C) *insight into*, is correct.
- (D) *of the country*, is correct.
- (E) This option is correct.

The correct answer is E.

- 28.** The aim is to find the phrase which is making the given statement grammatically incorrect. Subject-verb agreement has not been observed in the grammatical structure. Keeping this in mind one may analyse the given sentence.

- (A) 'again under pressure' is correct.
- (B) Correct. 'has resulted' is incorrect. The subject 'oil prices' require the plural verb 'have'.
- (C) 'an increased' is a grammatically correct expression.
- (D) 'for the dollar' is correct.
- (E) There is an error in B.

The correct answer is B.

- 29.** The aim is to find the phrase which is making the given statement grammatically incorrect. There is an error of diction in the sentence. Keeping this in mind one may analyse the given sentence.

- (A) 'ask your' is correct.
- (B) Correct. The use of 'unthaw' is incorrect. The word that should be used is 'thaw' which means to change from a solid frozen state to a soft or liquid one.
- (C) 'as I plan' is a grammatically correct expression.
- (D) 'have a smorgasbord' is correct. 'Smorgasbord' refers to a wide range of something; a variety.

(E) There is an error in B.

The correct answer is B.

30. The aim is to find the phrase which is making the given statement grammatically incorrect. There is an error of verb form in the sentence. Keeping this in mind one may analyse the given sentence.

(A) Correct. 'If I was' is incorrect. When expressing a wish, a suggestion, a command or a condition that is contrary to fact, we do so in the subjunctive mood. Hence, the correct construction would be 'If I were'

(B) The use of 'President' is correct.

(C) 'I would have made' is a grammatically correct expression.

(D) 'compulsory for all' is correct.

(E) There is an error in A.

The correct answer is A.

4 Choose the Correct Preposition

1. Option C is the right answer as 'ebd' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. Krishna said that he would arrive *between* 2 and 3 pm.
2. In the newly constructed shopping mall the shops stay open *from* 11 am to 11 pm.
3. The formalities are all over and the rocket is ready for launch *in* 30 minutes.

The correct answer is C.

2. Option B is the right answer as 'bef' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. You can work *towards* effective development.
2. You are strict *with* someone.
3. You are ahead *by* a long way.

The correct answer is B.

3. Option A is the right answer as 'acf' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. The administration's new proposals have been met *with* a lot of opposition from the citizens of the town.
2. The children are so excited to eat out that they are unable to choose between a pizza *and* a burger.

3. When asked to come to the party, Ramesh declined saying that he had decided to stay *at* home and study instead.

The correct answer is A.

4. Option C is the right answer as 'adc' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'With' is used with countable nouns for instruments.
2. 'In' is used with uncountable nouns for instruments.
3. 'Over' is used in the context of meal/tea/lunch and so on.

The correct answer is C.

5. Option B is the right answer as 'ade' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Beside' means by the side of.
2. 'Amongst' is used for vowel starting nouns.
3. 'Made from' is used when the condition of the material changes.

The correct answer is B.

6. Option B is the right answer as 'bac' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. Abstain from food or indulgence (fixed phrase) meaning 'refrain from'.
2. Exception to (fixed phrase).

3. Accord with (fixed phrase) meaning 'to agree with someone or something'.

The correct answer is B.

7. Option C is the right answer as 'bac' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. We use 'on' for entering a public transport vehicle.
2. We use 'by' for left or right of somebody or something.
3. We use 'different from' to mean something that is not the same as another.

The correct answer is C.

8. Option C is the right answer as 'dab' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. We use 'knock over' to indicate pushing someone or something that causes the person or thing to fall.
2. We use 'on foot' to indicate walking.
3. We use 'with an accent' to indicate 'having'.

The correct answer is C.

9. Option D is the right answer as 'bae' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. We use 'out of' to mean 'without'.
2. We use 'above' as a preposition when we want to indicate 'higher than' a figure or a benchmark.
3. 'Care for' means to feel affection for someone.

The correct answer is D.

10. Option C is the right answer as 'dba' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. **Under** refers to a condition of subjection, making it the correct word for sentence.
2. You selected **for** a seat.
3. You serve food **to** someone. 'To' is used as a function word to indicate action towards a person, place or thing.

The correct answer is C.

11. Option B is the right answer as 'ebd' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Comply with' means 'to act in accordance with a wish or command'.
2. 'Want of' means 'lack of'.
3. 'Insight into' means the power or act of seeing into a situation.

The correct answer is B.

12. Option D is the right answer as 'def' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Triumph over' means 'to achieve victory over someone or something'.
2. 'Side with' means 'to be on someone's side'.
3. 'Slur on' means 'an insinuation or allegation about someone that is likely to insult them or damage their

reputation.

The correct answer is D.

- 13.** Option C is the right answer as 'dae' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Over the weekend' means the same as during the weekend. It is used to talk about something that happened (or will happen) between Friday evening and Sunday evening.
2. 'On' is used with the plural word-weekends.
3. 'In' is used as a function word to indicate the larger member of a ratio.

The correct answer is C.

- 14.** Option D is the right answer as 'dca' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Persuade of' means to make someone do or believe something by giving them a good reason to do it or by talking to that person and making them believe it.
2. 'Under' means according to an agreement, a law or a system.
3. We use 'over' to show an apparent change in one's mood, attitude and so on.

The correct answer is D.

- 15.** Option E is the right answer as 'fcb' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'On' is used to show the possession of; being carried by.
2. We use 'with' to indicate a result attendant on a specified action.
3. If you are aboard a ship or plane, you are on it or in it.

The correct answer is E.

- 16.** Option B is the right answer as 'aeb' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'On' is used to indicate where someone or something is hit or touched.
2. 'Between' is used to indicate two or more people or things that together produce a result or have an effect.
3. 'Into' is used to describe the state, condition, or form of (something).

The correct answer is B.

- 17.** Option C is the right answer as 'bae' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'In' is used to indicate unspecific times during a day, season, year and so on.
2. 'To' is used to introduce the second part of a comparison or ratio.
3. 'Against'--- not to the advantage or favour of somebody/something.

The correct answer is C.

- 18.** Option D is the right answer as 'beb' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'See through' means not be deceived by or see clearly from one end to another end.
2. 'Stand out' means to be easily seen or noticed.
3. 'Run through' means to run out of something before the stipulated time, to exhaust a resource earlier than anticipated or planned for.

The correct answer is D.

- 19.** Option C is the right answer as 'fba' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Difference between' is a fixed phrase used for contrast or dissimilarity.
2. 'Differ from' is a fixed phrase which means to be unlike, or dissimilar.
3. 'Designed for' is a fixed phrase meaning do or plan (something) with a specific purpose in mind.

The correct answer is C.

- 20.** Option C is the right answer as 'bde' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Array' takes the preposition 'of' meaning an impressive display or range of a particular type of thing.
2. 'Focus on' is a fixed phrase which means to give most of your attention to someone or something
3. 'Push or sweep under the carpet' is a fixed phrase which means to ignore, deny, or conceal from public view or

knowledge something that is embarrassing, unappealing, or damaging to one's reputation

The correct answer is C.

21. Option B is the right answer as 'adb' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'Of' is used to show belonging.
2. To 'come under something' is to experience a bad situation
3. The only preposition that is used after the word 'subsequent' is 'to'.

The correct answer is B.

22. Option E is the right answer as 'cae' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. 'At the hospital' is a standard expression. We use 'at' for a point.
2. 'In the hospital' is a standard expression. We use 'in' for an enclosed space.
3. 'Mad about something' means to be crazy about someone or something.

The correct answer is E.

23. Option D is the right answer as 'bac' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. The formation of a star is accompanied *by* the release of gas and dust.
2. Albert Einstein is often regarded *as* the father of modern physics.
3. A rainbow is a beautiful display *of* vibrant colours.

The correct answer is D.

- 24.** Option D is the right answer as 'dae' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. It was a tough victory to pull *off* but they did it with aplomb.
2. It was disheartening to watch as they proceeded to quarrel and fall *out* with one another.
3. It is doubtful that after such a setback they will ever manage to put *aside* their differences and play together on the stage again.

The correct answer is D.

- 25.** Option B is the right answer as 'bdb' is the correct sequence of prepositions to be used in the given set of sentences.

As we can see:

1. He is in a hurry as he is leaving *for* Japan on the evening flight.
2. The road to perdition is paved *with* good intentions.
3. I have been working on this novel *for* many years now.

The correct answer is B.

5. Sentence Completion

1. **Keyword**—While there is no doubt

Connector—whether

Prediction for blank 1—superb

Prediction for blank 2—ability

- (A) 'Boring' means not interesting. 'Talent' means natural aptitude or skill. These are incorrect
- (B) 'Good' can be a fit here. 'Detriment' which means the state of being harmed or damaged is incorrect.
- (C) 'Average' means mediocre which is incorrect. 'Capability' means potential which can be a fit.
- (D) Correct. 'Excellent' is an apt fit. 'Potential' which means capability is also correct.
- (E) 'Upcoming' means coming up. 'Spectators' means onlookers. These can be negated.

The correct answer is D.

2. **Keyword**—there is no guarantee that gluten will not be present in the raw materials

Connector—since

Prediction for blank 1— cannot, should not

Prediction for blank 2—Safe

- (A) Correct. 'Cannot' is the negative of the verb 'can', 'Benign' means not harmful in effect.
- (B) 'Should 'is incorrect as we are looking for its contrast though 'unsafe' can be an option.

- (C) 'Will not' is incorrect here. 'Vulnerable' which means exposed to the possibility of being attacked or harmed, either physically or emotionally is also incorrect usage.
- (D) 'Claim to' means declare. 'Harmless' means safe. The first option is incorrect though 'harmless' can be an option.
- (E) 'Are not to' means cannot which can be a fit. 'Inconspicuous' which means not clearly visible or attracting attention is an incorrect option.

The correct answer is A.

3. Keyword—example of the process of natural selection

Connector—None

Prediction for blank—laid bare

- (A) 'Painted with' means covered the surface of (something) with paint. This is an incorrect option.
- (B) 'Coloured with' means change the colour of (something) by painting, dyeing, or shading it. This can be negated.
- (C) 'Satiated with' means to fill or supply beyond capacity or desire, often arousing weariness. This is also incorrect.
- (D) Correct 'Exposed to' means the fact of experiencing something or being affected by it because of being in a particular situation or place.
- (E) 'Whetted in' means increased or enhanced (the appetite, desire, and so on. This can also be negated.

The correct answer is D.

4. Keyword—not correct

Connector—none

Prediction for blank 1—distinguishing

Prediction for blank 2—but

- (A) 'Universal' means relating to or done by all people or things in the world or in a particular group. This cannot be a fit. 'Moreover' means 'in addition'. This is also incorrect.
- (B) 'Discriminating' means discerning. This can be a fit. 'Furthermore' means in addition. This is not a correct fit.
- (C) 'Subjective' means based on or influenced by personal feelings, tastes, or opinions. 'Surprisingly' means unexpectedly. These can be negated.
- (D) 'Contentious' means controversial. 'Nonetheless' means in spite of that. These are not correct fits.
- (E) Correct 'Differentiating' means to form or mark differently from other such things. 'However' means still or but.

The correct answer is E.

5. **Keyword**—worn purely for traditional or ceremonial purposes

Connector—because

Prediction for blank—logical

- (A) 'Accepted' means generally believed or recognised to be valid or correct. This is not the right fit.
- (B) Correct. 'Rational' means based on or in accordance with reason or logic.
- (C) 'Critical' means expressing adverse or disapproving comments or judgements. This can be negated.
- (D) 'Illogical' means lacking sense or clear, sound reasoning. This is not an appropriate answer.
- (E) 'Peculiar' means different from what is normal or expected; strange. This can also be cancelled out.

The correct answer is B.

6. Keyword—Laughing during the funeral

Connector—None

Prediction for blank 1—shocking

Prediction for blank 2—done

- (A) Correct. 'egregious', 'gross' and 'flagrant' mean shocking and obviously offensive. All three can fit in the first blank. 'Perpetrated' means carried out or committed (a harmful, illegal, or immoral action).
- (B) 'Inconspicuous' means not clearly visible or attracting attention. This can be cancelled out.
- (C) Though 'gross' can fit the first blank, the use of 'inflicted' is incorrect for the second blank. 'Inflicted' means caused (something unpleasant or painful) to be suffered by someone or something
- (D) Though 'flagrant' can fit the first blank, the use of 'executed' is incorrect for the second blank. Executed means put (a plan, order, or course of action) into effect.
- (E) 'Resplendent' means attractive and impressive through being richly colourful or sumptuous and 'wreaked' means caused (a large amount of damage or harm). This is not an appropriate answer.

The correct answer is A.

7. Keyword—The vegetation

Connector—But (contrast)

Prediction for blanks 1 and 2—lush—thin, thin-lush

- (A) Correct. 'Luxuriant', 'copious' and 'bountiful' mean abundant and can fit the first blank. 'Sparse' means

thinly dispersed and shows contrast. 'Luxuriant' and 'sparse' are the correct options.

- (B) 'Profuse' means the same as 'copious' and cannot fit the blank. We need a set of words that show contrast. Thus, this option can be negated.
- (C) 'Slender' and 'scanty' mean thinly dispersed or scattered. They can also fill the first blank. However, 'sporadic' means occurring at irregular intervals or only in a few places. This also does not indicate contrast. Hence, the option can be negated.
- (D) 'Exiguous' means very small in size or amount. This can also be negated.
- (E) 'Munificent' means displaying great generosity. This option can also be canceled.

The correct answer is A.

8. Keyword—wasn't aware

Connector—because of

Prediction for blank 1—morals or values

Prediction for blank 2—satisfaction or dissatisfaction

- (A) 'Turpitude' means moral corruption. Both, 'turpitude' and 'satisfied' are not an appropriate fit.
- (B) 'Depravity' also means moral corruption. Both, 'depravity' and 'certain' are not an appropriate fit.
- (C) Correct. 'Rectitude', 'righteousness' and 'morality' mean morally correct behaviour or thinking. They can fit the first blank. 'Rectitude' and 'convinced' are the only options which fit the blanks appropriately. A parent will usually believe his/her child to be a morally righteous person, unless convinced otherwise.

- (D) 'Coaxed' means to influence or gently urge by caressing or flattering. This is not an appropriate fit.
- (E) 'Unassertive' means (of a person) not having or showing a confident and forceful personality. This is also not an appropriate fit.

The correct answer is C.

9. Keyword—Budget travellers

Connector—when

Prediction for blank—reduce, drop

- (A) 'Escalate' means to 'increase rapidly'. This can be negated.
- (B) Correct. 'Plummet' means 'a steep and rapid fall or drop'.
- (C) 'Descend' means to 'pass from a higher place or level to a lower one'. This is not an appropriate option.
- (D) 'Abate' means become less intense or widespread.
- (E) Diminish means dwindle or weaken gradually in size, amount, or strength.

The correct answer is B.

10. Keyword—that he knows more

Connector—rather

Prediction for blank—overconfident

- (A) 'Discourteous' means 'showing rudeness and a lack of consideration for other people'.
- (B) 'Uncouth' means 'lacking good manners, refinement, or grace'.

- (C) Correct. 'Presumptuous' means '(of a person or their behaviour) failing to observe the limits of what is permitted or appropriate'.
- (D) 'Peremptory' means 'insisting on immediate attention or obedience'.
- (E) 'Arbitrary' means 'based on random choice or personal whim, rather than any reason or system'.

The correct answer is C.

11. Keyword—The police officer cornered

Connector—if

Prediction for blank 1—Unstable

Prediction for blank 2—Drunk

- (A) 'Startled' means 'astonished'. 'Restrained' means 'unemotional'. Both the words don't fit the context.
- (B) Correct. 'Staggering' means 'walk or move unsteadily, as if about to fall'. 'Inebriated' means 'drunk'.
- (C) 'Wobbly' means 'tending to move unsteadily from side to side'. 'Despondent' means 'in low spirits from loss of hope or courage'. Though the first word can fill the blank, the second word is unsuitable.
- (D) 'Rickety' means 'feeble in the joints'. This is not an appropriate fit for the context. 'Intoxicated' means 'drunk'. This can fill the second blank.
- (E) 'Fragile' means 'delicate and vulnerable'. 'Sober' means 'not affected by alcohol'. Both the words don't fit the context.

The correct answer is B.

12. Keyword—pretty ugly

Connector—both

Prediction for blank—contradictory terms

- (A) 'Sarcasm' means 'the use of irony to mock or convey contempt.'
- (B) 'Euphemism' means 'a mild or indirect word or expression substituted for one considered to be too harsh or blunt when referring to something unpleasant or embarrassing.'
- (C) Correct. 'Oxymoron' means 'a figure of speech in which apparently contradictory terms appear in conjunction.'
- (D) 'Antithesis' means 'a person or thing that is the direct opposite of someone or something else.'
- (E) 'Rhetoric' means 'the art of effective or persuasive speaking or writing, especially the exploitation of figures of speech and other compositional techniques'.

The correct answer is C.

13. Keyword—written by someone else

Connector—when

Prediction for blank—truthfulness

- (A) Correct. 'Veracity' means the 'quality of being truthful'.
- (B) 'Candour' means 'frankness'.
- (C) 'Fidelity' means 'faithfulness to a person, cause, or belief, demonstrated by continuing loyalty and support'.
- (D) 'Mendacity' means 'untruthfulness'. This is the opposite of the word required and can be negated.
- (E) 'Congruity' is 'a quality of agreement and appropriateness'.

The correct answer is A.

14. Keyword—The road is quite

Connector—None

Prediction for blank 1—winding

Prediction for blank 2—dizzy

- (A) 'Meandering' means 'following a winding course'. This can fill the first blank. 'Bizarre' means 'very strange or unusual'. This is not an appropriate fit.
- (B) 'Discursive' means 'digressing from subject to subject'. This can be negated. 'Giddy' means 'dizzy'.
- (C) Correct. 'Serpentine' means 'curving and twisting like a snake'. 'Light headed' means 'dizzy'.
- (D) 'Sinuous' means 'having many curves and turns'. This can fill the first blank. 'Surreal means 'strange'. This is not an appropriate fit.
- (E) 'Digressive' means 'tending to depart from the subject'. This can be cancelled out. 'Nauseous' means 'feeling inclined to vomit'.

The correct answer is C.

15. Keyword—the new evidence

Connector—None

Prediction for blank 1—clear

Prediction for blank 2—accused

- (A) 'Exonerate' means '(of an official body) absolve (someone) from blame for a fault or wrongdoing. This can be used for the first blank. 'Guillible' means someone who is easily influenced, swayed. This is incorrect.

- (B) Correct. 'Vindicate' means 'clear (someone) of blame or suspicion'. 'Defendant' means 'an individual, company, or institution sued or accused in a court of law'.
- (C) 'Castigate' means to 'reprimand (someone) severely'. 'Criminal' means 'a person who has committed a crime'. This option can be cancelled out.
- (D) 'Censure' means 'express severe disapproval of (someone or something), especially in a formal statement'. 'Wrongdoer' means 'a person who behaves illegally or dishonestly'.
- (E) 'Acquit' means 'free (someone) from a criminal charge by a verdict of not guilty'. This can be used to fill the first blank. 'Reprobate' means 'an unprincipled person'.

The correct answer is B.

16. Keyword—the fact that the students were bored

Connector—None

Prediction for blank 1—Heedless

Prediction for blank 2—Lecture

- (A) Correct. 'Oblivious' means 'not aware of or concerned about what is happening around one'. 'Harangue' means 'a lengthy and aggressive speech'.
- (B) 'Unheeding' means 'showing a reckless lack of care or attention'. Though the word fits with respect to the meaning, its usage will render the sentence grammatically incorrect. 'Rant' means 'speak or shout at length in an angry, impassioned way'. This can be used for the second blank.
- (C) 'Indifferent' means unconcerned'. 'Onslaught' means 'a fierce or destructive attack'.

- (D) 'Impervious' means 'showing a reckless lack of care or attention'. 'Polemic' means 'a strong verbal or written attack on someone or something'.
- (E) 'Impassive' means 'not feeling or showing emotion'. 'Panegyric' means 'a public speech or published text in praise of someone or something'. This option can be cancelled out.

The correct answer is A.

17. Keyword—most feared animal on Earth

Connector—But

Prediction for blank 1—Reduces

Prediction for blank 2—Ominous

Prediction for blank 3—Puzzled

- (A) 'Diminish' means to 'make or become less. 'Joyous' means 'happy. 'Dazed' means to make someone unable to think or react properly. This option can be negated.
- (B) 'Contract' means to 'decrease in size, number, or range. This can fill the first blank. 'Quiver' means to 'tremble or shake with a slight rapid motion'. 'Cheeky' means 'showing a lack of respect or politeness in a way that is amusing or appealing'. Both these are not an appropriate fit.
- (C) 'Stiffen' means 'make or become stiff or rigid'. This is unsuitable. 'Menacing' means 'threatening'. 'Intimidate' means to 'frighten'.
- (D) Correct. 'Taper' means 'diminish or reduce in thickness towards one end. 'Sinister' means 'giving the impression that something harmful or evil is happening or will happen'. 'Bemused' means 'puzzle, confuse, or bewilder'.

- (E) 'Subside' means 'become less intense, violent, or severe'. 'Threatening' means 'ominous'. 'Indignant' means 'resentful'. None of the words fit the context.

The correct answer is D.

18. Keyword—than many give it credit for

Connector—and

Prediction for blank 1—Varied

Prediction for blank 2—Hint

Prediction for blank 3—Innumerable

- (A) 'Distinct' means 'recognizably different in nature from something else of a similar type'. This is appropriate in the context. 'Traces' means 'a mark, object, or other indication of the existence or passing of something'. 'Multitude' means 'a great number of people or thing'. This is grammatically inappropriate.
- (B) 'Disparate' means 'essentially different in kind'. 'Vestige' means 'a trace or remnant of something that is disappearing or no longer exists'. 'Profuse' means 'abundant'. This option can be cancelled.
- (C) Correct. 'Diverse' means 'showing a great deal of variety'. 'Echoes' means 'detail or feature which reminds you of something else'. 'Myriad' means 'a countless or extremely great number of people or things'. This is the correct answer.
- (D) 'Distinguishable' means 'clear enough to be recognised or identified as different'. 'Memento' means 'an object kept as a reminder of a person or event'. 'Excessive' means 'more than is necessary'. This is not an appropriate fit.

- (E) 'Different' means 'not the same as another or each other'. 'Reminder' means 'a thing that causes someone to remember something'. 'Riot' means 'an impressively large or varied display of something'.

The correct answer is C.

- 19. Keyword**—clearly inspired by the challenge of reproducing the event

Connector—and

Prediction for blank 1—Calamities

Prediction for blank 2—Credibility

Prediction for blank 3—Unthinkable

- (A) 'Tragedy' means 'an event causing great and often sudden damage'. This can be a fit. 'Authenticity' is the quality of being genuine or real. 'Conceivable' means 'capable of being imagined or grasped mentally. This is incorrect.
- (B) 'Calamity' means 'a disaster'. 'Plausibility' means 'the quality of seeming reasonable or probable'. 'Ineffable' means 'too great or extreme to be expressed or described in words. This option can be negated.
- (C) 'Affliction' means 'a cause of pain or harm'. 'Chicanery' means 'the use of deception or subterfuge to achieve one's purpose. 'Improbable' means 'not likely to be true or to happen'. These words are not relevant in the context.
- (D) Correct. 'Disaster' means 'a sudden accident or a natural catastrophe that causes great damage or loss of life. 'Verisimilitude' means 'the appearance of being true or real. 'Inconceivable' means 'unbelievable'.

- (E) 'Tribulations' means 'a cause of great trouble or suffering'. 'Artfulness' means 'slyly crafty or cunning'. 'Unimaginable' means 'difficult or impossible to imagine or comprehend'.

The correct answer is D.

20. Keyword—novel technique

Connector— none

Prediction for blank—presence

- (A) Correct. 'Contamination' means the action of making something impure by polluting or poisoning.
- (B) 'pollution' means the presence of something in the environment that has a harmful effect. Though the word is correct with respect to the meaning, its use will make the sentence grammatically incorrect.
- (C) 'availability' refers to the quality of being used or obtained.
- (D) 'mixture' refers to a substance made by mixing other substances.
- (E) 'besmirch' means to damage someone's reputation.

The correct answer is A.

6. Analogies

1. This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem—

The function of police is to control crime.

Now, plug the bridge into the answer choices:

- (A) The function of a theft is to control watchman. Incorrect *(be careful as the bridge is not this—the job of a watchman is to control theft)*.
- (B) The function of eat is control food. Incorrect.
- (C) The function of exercise is to control weight. *Not necessarily*. People may exercise for other reasons as well, such as to improve their general fitness even if they are not overweight.
- (D) The function of a dam is to control floods. Correct.
- (E) The function of a football is to control play. Incorrect.

The correct answer is D.

2. This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— A cleaver is used by a butcher to cut meat.

Now, plug the bridge into the answer choices:

- (A) A screwdriver is used by a mechanic to screw and unscrew screws and not cut. Incorrect
- (B) A treadmill is used by a runner to run and not cut. Incorrect

- (C) A pen is used by a writer to write and not cut. Incorrect
- (D) A scalpel is used by a surgeon to cut through skin and flesh. Correct
- (E) A brush is used by a painter to paint and not cut. Incorrect

The correct answer is D.

3. This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— A captain is a person in command of a ship.

Now, plug the bridge into the answer choices:

- (A) A teacher is in command of a school. This may be true but not necessarily. Incorrect
- (B) A manager is in command of an office. Correct
- (C) A guide is in command of a tourist. Incorrect
- (D) A doctor is in command of a hospital. This may or may not be true Incorrect
- (E) A hotel is in *command of a concierge*. Incorrect

The correct answer is B.

4. This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— Loathe is a high degree of dislike

Now, plug the bridge into the answer choices:

- (A) Discomfort is a high degree of pain. Incorrect
- (B) Foolhardy is a high a degree of coward. Incorrect
- (C) Anxious is a high degree of disquiet. Disquiet is a feeling of anxiety but it does not relate to the given pair.

Incorrect

- (D) Stress is a high degree of fear. Incorrect
- (E) Ecstasy is a high degree of joy. They are synonyms and relate to the given pair. Correct

The correct answer is E.

5. This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. In case of this question, an altruistic person lacks selfishness.

Now, plug the bridge into the answer choices:

- (A) An enlightened person lacks wisdom. Incorrect
- (B) A befuddled person lacks clarity. Correct
- (C) A flippant person lacks calm. This may or may not be true. Incorrect
- (D) An assiduous person lacks diligence. Incorrect
- (E) A depressed person lacks sorrow. This does not relate to the given pair. Incorrect

The correct answer is B.

6. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— Metal is a type of music. It developed in the late 1960s and early 1970s.

Now, plug the bridge into the answer choices:

- (A) Expressionism is a type of painting. Incorrect.
- (B) Risotto is a type of dish. Incorrect.
- (C) Clarinet is a type of musical instrument. Incorrect.
- (D) Bolero is a type of dance not dress. Correct.

(E) Cha cha is a type of dance. Incorrect.

The correct answer is D.

7. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— The relationship between the original pair is that although the words in the pair mean the same but their connotation is different. ‘Scrawny’ has a negative connotation and means (of a person or animal) unattractively thin and bony. Slim refers to a person who is slender, gracefully thin.

Now, plug the bridge into the answer choices:

- (A) ‘Nitpicking’ means giving too much attention to details that are not important, especially as a way of criticizing (meticulous in a negative way, very precise). Incorrect.
- (B) ‘Shocking’ has a negative usage and ‘surprising’ has a positive usage. Incorrect.
- (C) ‘Economical’ means careful not to waste money or resources and ‘miserly’ is stingy. Incorrect.
- (D) ‘Inquisitive’ is ‘being curious’ and ‘nosey’ means showing too much curiosity about other people’s affairs. Incorrect.
- (E) ‘Ludicrous’ and ‘absurd’ are synonyms and mean ‘foolish, unreasonable, or out of place as to be amusing’. Correct.

The correct answer is E.

8. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— The relationship shared between

the original pair is that the first is worn on the second. A 'tiara' is worn on the hair.

Now, plug the bridge into the answer choices:

- (A) A 'muffler' is worn around the neck. Incorrect.
- (B) An 'anklet' is worn around the ankle. Incorrect.
- (C) A 'cravat' is worn around the neck. Incorrect.
- (D) A 'girdle' is worn around the waist and not the wrist. Correct.
- (E) A 'sash' is worn around the waist or over one's shoulder. Incorrect.

The correct answer is D.

9. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— The relationship between the original pair is that the first concerns itself with the study of the second. Thus, 'paleontology' is the study of fossils.

Now, plug the bridge into the answer choices:

- (A) 'Entomology' is the study of insects. Incorrect.
- (B) 'Seismology' is the study of earthquakes. Incorrect.
- (C) 'Petrology' is the study of rocks. Incorrect.
- (D) 'Anthropology' is the study of mankind. Incorrect.
- (E) 'Ornithology' is the study of birds and not fish. Correct.

The correct answer is E.

10. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words

given in the question stem— The original set of words share a 'part to whole relationship'. 'Canto is a part of a poem.

Now, plug the bridge into the answer choices:

- (A) An 'island' is a part of an 'archipelago'. Incorrect.
- (B) A 'piston' is a part of an engine. Incorrect.
- (C) A 'canopy' is an overhead roof or else a structure over which a fabric or metal covering is attached which is able to provide shade or shelter from weather conditions such as sun, hail, snow and rain. It is not a part of rain making. Correct.
- (D) 'Mast' is a part of a boat. It refers to a large wooden spar used to hold up other spars and the rigging. Incorrect.
- (E) 'Staircase' is an integral part of a building. Incorrect.

The correct answer is C.

11. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— The relationship shared by the original pair is that of 'degree of intensity'. 'Tepid' means slightly warm which is a mild degree of 'boiling.'

Now, plug the bridge into the answer choices:

- (A) 'Punctilious' means showing great attention to detail or correct behavior. Incorrect.
- (B) A 'downpour' is a heavy rainfall. Incorrect.
- (C) 'Dote' means to be extremely and uncritically fond of somebody. Incorrect.
- (D) Both 'avaricious' and 'rapacious' mean to be extremely greedy. Correct.

- (E) 'Vainglorious' means to be excessively vain or proud. Incorrect.

The correct answer is D.

- 12.** This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— 'Denigrate' and 'belittle' are synonyms that mean 'to criticise unfairly'. The relationship shared is that of synonyms.

Now, plug the bridge into the answer choices:

- (A) 'Dearth' and 'scarcity' are synonyms meaning of 'a lack of something'. Incorrect.
- (B) 'Ephemeral' and 'transitory' are synonyms meaning 'lasting for a very short time'. Incorrect.
- (C) 'Ineptitude' means 'lacking skill or ability' making it an antonym for 'competence'. Correct.
- (D) 'Indolent' and 'lazy' are synonyms. Incorrect.
- (E) 'Facile' and 'superficial' are synonyms meaning of 'ignoring the true complexities of an issue'. Incorrect.

The correct answer is C.

- 13.** This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— 'Mozzarella' is a type of cheese. Thus, the relationship between the original pair is that the first is a type of the second.

Now, plug the bridge into the answer choices:

- (A) 'Spaghetti' is a type of pasta. Incorrect.
- (B) 'Moccasin' is a type of shoe not dress. Correct.

- (C) 'Macchiato' is a type of coffee. Incorrect.
- (D) 'Viper' is a type of snake. Incorrect.
- (E) 'Chrysanthemum' is a type of flower. Incorrect.

The correct answer is B.

- 14.** This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— A 'quiver' is a group of cobras. The relationship shared between the original pair is that the first denotes a group of the second.

Now, plug the bridge into the answer choices:

- (A) A a group of fish is called a 'school'. Incorrect.
- (B) A group of pigeons is called a 'flock' or a 'flight'. Congregation refers to a collection of people. Correct.
- (C) A group of antelopes is called a 'herd'. Incorrect.
- (D) An group of caterpillars is called 'army'. Incorrect.
- (E) A 'float' refers to a group of crocodiles. Incorrect.

The correct answer is B.

- 15.** This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— 'Fit as a fiddle' is a simile. A simile is a figure of speech that directly compares two things.

Now, plug the bridge into the answer choices:

- (A) 'Fresh as a daisy' is a simile. Incorrect.
- (B) 'Slippery as an eel' is a simile. Incorrect.
- (C) 'Straight as an arrow' is a simile. Incorrect.
- (D) 'Mad as a hatter' is the correct simile. Correct.

(E) 'Quiet as a church mouse' is a simile. Incorrect.

The correct answer is D.

16. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— A 'bristle' is a part of a brush. Thus, the relationship between the original pair is that the second is a part of the first.

Now, plug the bridge into the answer choices:

- (A) A 'stamen' is a part of a flower. Incorrect.
- (B) A 'pericarp' is a part of a fruit. Incorrect.
- (C) A 'fuselage' is a part of an aircraft. Incorrect.
- (D) An 'awning' is not a part of a billboard. It is a secondary covering attached to the exterior wall of a building. Correct.
- (E) 'Woodwinds' is a part of a symphony orchestra. The typical symphony orchestra consists of four groups of related musical instruments called the woodwinds, brass, percussion, and strings (violin, viola, cello and double bass). Incorrect.

The correct answer is D.

17. This is an analogy based question. The idea here is to find the option which **does not** draw a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— 'Address' and 'location' are synonyms that refer to the 'particulars of a place where someone lives or an organisation is situated'. The relationship shared is that of synonyms.

Now, plug the bridge into the answer choices:

- (A) The words 'annul' and 'abrogate' are synonyms that mean— 'to declare an agreement, decision or result as invalid'. Incorrect.
- (B) The words 'bark' and 'snap' are synonyms that mean— 'to utter a command or question abruptly or angrily'. Incorrect.
- (C) The words 'mean' and 'generous' are antonyms. 'Mean' refers to cruel or spiteful behavior while 'generous' refers to kind and magnanimous conduct. Correct.
- (D) The words 'die' and 'expire' are synonyms that mean— 'to perish, stop living'. Incorrect.
- (E) The words 'current' and 'present' are also synonyms. They refer to contemporary, ongoing activities or events. Incorrect

The correct answer is C.

- 18.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— Kind and benevolent are synonyms. The relationship shared is that of synonyms.

Now, plug the bridge into the answer choices:

- (A) Empty and full are synonyms. Incorrect
- (B) Blemish and loyalty are synonyms. Incorrect
- (C) Absurd and rational are synonyms. Incorrect
- (D) Stubborn and obstinate are synonyms. Correct
- (E) Capricious and unchanging are synonyms. Incorrect

The correct answer is D.

- 19.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the

given pair. Start by making a bridge between the words given in the question stem— The relationship shared between the original pair is that the second is a protective outer case of the first. Now, plug the bridge into the answer choices:

- (A) The same relationship is demonstrated in A where a 'rind' is the tough, outer skin of a 'lemon'. This makes it the correct answer. Correct.
- (B) A 'marshmallow' is a 'confection' or a 'sweet dish'. Incorrect.
- (C) An 'orange' is a 'citrus fruit' which refers to a group of plants that produce acidic fruits with a lot of juice. Incorrect.
- (D) 'Rosa' is the scientific name for a 'rose'. Incorrect.
- (E) A 'chocolate' is 'edible'; it means that it is fit to be eaten. Incorrect.

The correct answer is A.

- 20.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— 'Hedonism' refers to the pursuit of pleasure. The relationship shared is that of a philosophy and its central belief.

Now, plug the bridge into the answer choices:

- (A) Asceticism is the philosophy of self-denial. It is characterised by abstinence from sensual pleasures and pursuit of spiritual goals. Incorrect.
- (B) Altruism is the quality of unselfish concern for the welfare of others. Incorrect.
- (C) Sexism refers to the discriminatory, stereotypical and prejudiced attitude adopted towards people-usually women-based on their sex. Incorrect.

- (D) Eidolism refers to the belief in ghosts. Correct.
- (E) Nihilism refers to the philosophy that advocates the rejection of all religious and moral principles and states that life is meaningless. Incorrect

The correct answer is D.

- 21.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— A ‘basil’ is a type of ‘herb’. Thus, the relationship between the original pair of words is that the first is an example of the second.

Now, plug the bridge into the answer choices:

- (A) A ‘Ragdoll’ is a breed of cat. Correct.
- (B) A ‘frigate’ is a warship and not an aircraft. Incorrect.
- (C) An ‘Alaskan Husky’ is a dog breed not related to fox. Incorrect.
- (D) Marmots and squirrels belong to the same family (Sciuridae). Incorrect.
- (E) ‘Equine’ refers to a horse or other members of the horse family. Incorrect.

The correct answer is A.

- 22.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— ‘Disheveled’ means (of a person’s hair, clothes, or appearance) untidy; disordered. The relationship between the original pair of words is that of antonyms.

Now, plug the bridge into the answer choices:

- (A) 'Disdain' means the feeling that someone or something is unworthy of one's consideration or respect. 'Contempt' is a synonym of disdain. Incorrect.
- (B) 'Discrepancy' means an illogical or surprising lack of compatibility or similarity between two or more facts. 'Affront' means insult. They are unrelated. Incorrect.
- (C) 'Kindle' and 'ignite' are synonyms and mean to set (something) on fire. Incorrect.
- (D) 'Dispel' and 'dissipate' are also synonyms and mean (with reference to a feeling or emotion) disappear or cause to disappear. Incorrect.
- (E) 'Exasperate' means to make (someone) extremely angry and impatient. 'Please' means to make someone happy or satisfied. They are antonyms and thus the correct answer. Correct.

The correct answer is E.

- 23.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— The relationship shared by the original pair is that of 'degree of intensity'. 'Trickle' means a small flow of liquid which is a mild degree of 'gush'.

Now, plug the bridge into the answer choices:

- (A) 'Plunder' and 'pillage' are synonyms. Incorrect
- (B) 'Quash' and 'revoke' are also synonyms. Incorrect
- (C) A 'breeze' is a gentle wind which is a mild degree of 'gale'. Correct.
- (D) An 'acorn' is a pale oval nut that is the fruit of an oak tree. Incorrect
- (E) 'Ebb' is the movement of the tide out to sea. Incorrect

The correct answer is C.

- 24.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— ‘Trepidation’ causes trembling. The relationship shared by the original pair is that of cause and effect.

Now, plug the bridge into the answer choices:

- (A) An ‘earthquake’ causes tsunami. Correct.
- (B) ‘Snowflakes’ do not cause a deluge. Incorrect.
- (C) ‘Acquittal’ does not cause incarceration. Incorrect.
- (D) Something ‘cold’ does not cause a scald. Incorrect.
- (E) ‘Sickness’ and affliction are synonyms. Incorrect.

The correct answer is A.

- 25.** This is an analogy based question. The idea here is to find the option which draws a similar relationship to that of the given pair. Start by making a bridge between the words given in the question stem— Bread is made of grain.

Now, plug the bridge into the answer choices:

- (A) Many is made of berries. Incorrect
- (B) Drink is made of alcohol. Incorrect
- (C) Hot is made of beverage. Incorrect
- (D) Fruit is made of grapes. Incorrect
- (E) Wine is made of fruit. Correct

The correct answer is E.

6.0 Logical Reasoning Review

6.0 Logical Reasoning Review

The word 'logic' is derived from the Greek word 'logos', which means a word that expresses a thought or some information. This section, accordingly, measures your ability to comprehend and synthesise the information given in the question, without bothering with the truth or accuracy of that information. You will be asked to draw conclusions from statements, choose between strong and weak arguments, identify assumptions implicit within innocuous-looking statements and even arrive at decisions in light of the given information.

You will also be required to use your lateral thinking skills on questions that require you to decode patterns—both numerical and visual—and series, make sense of relationships and understand directions. The key, while attempting Logical Reasoning questions, is to focus only on the information given to you and not allow any of your own knowledge, experiences or presumptions to cloud your judgment.

The first section 'Critical Reasoning', includes the following topics:

1. Conclusion based questions
2. Inference based questions
3. Assumption based questions
4. Questions on strengthening/weakening

The second section 'Deductions', includes the following topics:

1. Statement-Conclusion
2. Statement-Assumption
3. Statement-Course of Action
4. Fact analysis
5. Statement-Argument

The third section 'Analytical Puzzles', includes the following topics:

1. Analytical Puzzles
2. Input-Output

The fourth section 'Other Reasoning', includes the following topics:

1. Missing value in figures
2. Set Theory
3. Decision Making
4. Ranking Test
5. Venn Diagrams
6. Syllogism

6.1 Top Tips to Prepare for Logical Reasoning

1. You will get **36 questions** in the Logical Reasoning section on the NMAT by GMAC™ that you will have to attempt in **40 minutes**. You will have about 1 minute for each question.
2. This section will test you on two areas of Reasoning—Verbal Reasoning and Analytical Reasoning.
3. Read every part of the question carefully. Similarly, make sure you have looked at each answer choice before selecting your final answer. Even if you like an option at the first glance, make sure you have taken a look at all the remaining options as well before marking your answer.
4. NEVER assume or use any information that is not provided in the question. This section is not trying to assess your general knowledge. Consider ONLY the information given in each statement and use this to answer the question.
5. Pay special attention to words like ‘all’, ‘some’ or ‘none’ when you read the factual information provided in each question. Other qualifying words such as ‘other than’, ‘only’ or ‘unless’ are also important. These words can play a critical part in precisely specifying the facts that need to be used while reasoning.
6. Try to represent the given information pictorially, especially in arrangement questions, or as a Venn diagram in syllogism questions.
7. Logical Reasoning skills cannot be developed overnight, so make sure you spend a lot of time before the test practising Logical Reasoning questions and analysing your mistakes.

6.2 Critical Reasoning

6.3 What is Measured?

The critical reasoning section will test you on your ability to analyse arguments logically. It will present you with a small passage in the form of an argument and you will be required to use logic to evaluate the strength of the arguments, identify assumptions and conclusions, provide supporting statements, replicate the reasoning and so on.

This section not only tests your understanding of English; it also tests your logical reasoning ability.

6.4 Overall Test Taking Strategies

1. Read the passage carefully. Identify the premises, assumptions and conclusion.
2. Make sure you have identified the conclusion of the passage correctly.
3. Read the question stem to understand what has to be done (strengthen / weaken / find assumption etc.) and then try to formulate a broad idea in your mind.
4. Go through the answer choices and use the process of elimination to arrive at the correct solution.

Introduction

Critical reasoning is a process. It involves conceptualisation, analysis and application of objective, rational reasoning in order to arrive at conclusions.

To be skilled in critical thinking is to be able to deconstruct one's thinking into individual arguments, analyse each one on its merit, assess its validity and improve upon it. The first step in this process is gaining an understanding of the elements of reasoning.

In critical reasoning, we are given an argument (a short paragraph) and asked to answer questions based on it. Let us first define an argument.

Arguments constitute the basis of conversation. They are combinations of facts, data, information and opinion that aim to influence the perspective of the other person.

Structure of an argument

All arguments follow a structure, which may either be deliberate or discovered through analysis.

At its simplest, an argument is a simple set of three things:

1. Facts

Facts are also referred to as **premise** in logic. By now, we can recognise the conclusion in a critical reasoning paragraph. Typically, this conclusion is proven with some information that is provided with the conclusion—this information are the **premises**. A premise (or premises) of an argument is something that is presented as being true. Although it is not proven, its truth is assumed in the given scenario.

Premises: *The people in this city are mad.*

I am 5 feet tall

Identifying premises:

Premise is generally preceded by words like

Because	In view of
Since	Given that

How do we spot these premises? Simple, once you remove the conclusion from the paragraph, the rest of the sentences are the premises. Another way to look at the premises is to see that they provide the 'why' for a conclusion, that is, why has the author come to this conclusion?

2. Conclusion

Is the final result which an argument arrives at. It is the statement/claim which you want to convince the other person about. A conclusion is drawn from the premises. These act as the support for the conclusion and reinforce the argument in its favor.

In the statement, 'I can participate in the Beauty pageant because I am 6 feet ', the part 'I can participate in the Beauty pageant' is the conclusion or result.

A useful way of spotting a conclusion is to identify its construction. It can be presented as an advice or strong recommendation, stating a preferable course of action. It may also be persuasive in its construction, highlighting the desirability of a particular decision, as compared to another.

Identifying a conclusion:

- Look for conclusion either at the beginning or at the end of the passage. However, please keep in mind that the conclusion can occur anywhere in a paragraph. In fact, in rare cases it may not be explicitly stated anywhere in the paragraph.

So, in order to identify the conclusion, ask yourself:

- What is the main point of this paragraph?
- What does the author want to prove?

The answer to these questions is the conclusion.

- Trigger words that signal a conclusion are:

Therefore	Thus
So	Hence
Implies	Indicates

- Look for statements that cannot stand alone.
- Or, look for facts that are part of the argument.

The conclusion is the main reason for the paragraph to be written.
It is proven with the help of some premises.

Since the premise is stated by the author to be true, you cannot question the validity of the premise.

Recognizing the conclusion correctly is imperative and any errors in this process will most likely lead you to select an inappropriate answer choice. So spend some time to identify the correct conclusion.

3. Assumption

The third part of our argument. An assumption is an unstated premise that supports the conclusion. Both premise and assumption are unquestionable facts but the assumption, unlike the premise, is not explicitly stated and needs to be deciphered.

So where does the assumption come in? Most arguments are not complete logically: the gap in logic is the assumption that the author makes to prove the conclusion.

Another way to spot the assumption is to think: When does this argument not make sense? If you can complete the next sentence then you have your assumption: *The conclusion does not make sense unless _____ is true.*

Therefore, an analysis of an argument consists of:

1. Ability to identify the premises and the conclusion which they reiterate.
2. Ability to spot the unstated links in the argument while moving from facts to conclusions or vice-versa. It is these links that identify the underlying assumptions in the argument.

Critical Reasoning questions can be broadly divided into certain categories:

1. Identify the assumption
2. Identify the conclusion (Inference/ conclusion)
3. Strengthen/Weaken the argument
4. Miscellaneous question type

Critical Reasoning is a fairly common verbal question type in various Management Aptitude Tests (in GMAT, it constitutes approximately 30% of the verbal section). One can enhance one's accuracy in this section through extensive practice.

Structure of a critical reasoning passage

As stated above, Critical Reasoning examines the reasoning skills of the test-taker. In particular, it evaluates the comfort level of the test taker with:

- Logical argument construction
- Argument evaluation
- Ability to list down premises that can strengthen or weaken a stated argument

Critical Reasoning questions come in the form of a paragraph (this usually presents an argument), and a question around the paragraph. Let's look at a typical Critical Reasoning question.

Example 1

A recent survey on the causes of stress was conducted by ABC Ltd. They worked with a sample of 100 employees of a multinational corporation and found out that people with hair loss suffer from more stress than people without hair loss. Hence, they concluded that hair loss is one of the causes of stress.

Which of the following, if true, would most weaken the argument given above?

- (A) There are other causes like financial instability that may cause more stress than hair loss.
- (B) Employees have been experiencing hair loss in recent times whereas they have been experiencing the same levels of stress for a very long time.
- (C) The study should also consider people who face no stress.
- (D) Stress may have a large number of factors that cause it.
- (E) Recently, there has been a decline in the reported instances of hair loss.

The above example can be broken down into three components:

1. The question stem

Which of the following, if true, would most weaken the argument given above?

2. The background to solve the question

A recent survey on the causes of stress was conducted by ABC Ltd. They worked with a sample of 100 employees of a multinational corporation and found out that people with hair loss suffer from more stress than people without hair loss. Hence, they concluded that hair loss is one of the causes of stress.

3. The answer choices

- (A) There are other causes like financial instability that may cause more stress than hair loss.

- (B) Employees have been experiencing hair loss in recent times whereas they have been experiencing the same levels of stress for a very long time.
- (C) The study should also consider people who face no stress.
- (D) Stress may have a large number of factors that cause it.
- (E) Recently, there has been a decline in the reported instances of hair loss.

Solving critical reasoning questions

Let us try and understand the approach for solving Critical Reasoning questions. The process is simple:

1. Read the question stem.
2. Read the paragraph and analyse it keeping the question in mind.
3. State what a good answer can look like.
4. Now look at the answer choices and eliminate the incorrect choices.

Step 1: Read the question stem.

‘Which of the following, if true, would most weaken the argument given above?’

Step 2: Read the paragraph.

The question wants us to weaken the argument, that is, the conclusion of the paragraph. Hence while reading, you have to spot the conclusion and be aware of the premises that validate the conclusion. In this case, the conclusion is ‘hair loss is one of the causes of stress’. The reason—because people with hair loss suffer from more stress.

Step 3: State what a good answer can look like.

What is wrong with this argument? Well, just because hair loss and stress occur together does not mean that hair loss leads to stress. It could easily be stress that causes hair loss or they can be two random events that just co-incidentally occur together.

Here is **an interesting fact**: In the USA, it was found that beer and diapers are usually bought together in department stores. Using this fact, if I come to the conclusion that drinking beer leads to loss of bladder control (hence, the diapers) or worse still, wearing diapers leads to a craving for beer, then I am obviously wrong. So, just because two things (beer and diapers) occur together does not imply that one causes the other. This could be one of the answers.

Step 4: Eliminate the incorrect answer choices.

- (A) There are other causes like financial instability that may cause more stress than hair loss.

This just shows that there are other causes; it does not negate hair loss as a cause.

- (B) Employees have been experiencing hair loss in recent times whereas they have been experiencing the same levels of stress for a very long time.

If people are experiencing the same level of stress even before hair loss, then may be hair loss does not cause the stress. Clearly if hair loss causes stress then with the advent of hair loss there would have at least been an increase in stress.

- (C) The study should also consider people who face no stress.

If I want to explore the causes for stress then studying people who have no stress will not be very helpful.

- (D) Stress may have a large number of factors that cause it.

Like the first option, this also just shows that there are other causes; it does not negate hair loss as a cause.

- (E) Recently, there has been a decline in the reported instances of hair loss.

This statement has no bearing on the main argument being discussed.

The correct answer is option B.

Some observations:

- What we thought our answer can look like and what was the actual answer were two different things. That's fine! Forming an approximate answer ensures that you have understood and imbibed the paragraph.
- The key to solving a Critical Reasoning question lies in the question stem. Hence, it is important to read it first because the question stem will dictate how you will analyse the paragraph. This obviously leads us to the analysis of question stem.

So, what kind of question stems can we come across and what kinds of analyses are possible?

Types of questions

1. Working with Assumption(s):

- **Type 1:** Find the **assumption** that the Author makes.
Identify the gap that will takes us from the premise to the conclusion.
- **Type 2: Strengthen the Conclusion** that the Author makes.
If the **assumption** that the author makes is true, then the conclusion will be strengthened.
- **Type 3: Weaken the Conclusion** that the Author makes.
If the **assumption** that the author makes is false, then the conclusion will be weakened.
- **Type 4: Find the flaw** in the Author's reasoning.
Similar to weaken the conclusion—the **assumption** has to be false.
- **Type 5: Evaluate the argument** that the Author presents.
Information about the **assumption** i.e. whether the assumption is True or False will help us evaluate the argument.
- **Type 6:** Explain the discrepancy or paradox in the argument.
What **assumption or new evidence** will help explain the unlikely conclusion?

2. Working with the Structure of the Argument

- **Type 1:** Describe the role that the phrases in bold play.
Understand the **structure** of the argument
- **Type 2: Identify the reasoning.**
Understand the **structure** of the argument
- **Type 3:** Parallel the reasoning.
Understand the **structure** of the argument and spot a similar structure in the option choices.

3. Working with the conclusion

- **Type 1:** Identify inference.

Given the argument, which of the following **conclusions has to be true?**

- **Type 2:** Resolve the Paradox.

Which of the following statements **resolves the paradox?**

Let us now look at the different question types in detail:

Conclusion based questions

Conclusion questions will ask you to conclude something from the information given in the passage. In such questions you have to arrive at a decision or judgement after careful consideration of the information given in the passage.

Conclusion vs Inference

There is a very subtle difference between an inference and a conclusion. A conclusion in a given statement is very specific to the argument in that it is given in the passage as part of the argument while an inference is more generic and drawn from the given premises and the conclusion given in the passage. Let's take an example:

Argument: When children are given the sugar-rich drink 'Fonza' they start showing erratic and overly aggressive behaviour.

Inference: Sugar-rich drink 'Fonza' has a negative impact on children's behaviour.

Conclusion: The sugar-rich drink 'Fonza' causes children to behave aggressively.

Consider the example given below as well:

Example 1

Recent advances in cataract surgery indicate that medicines and medical procedures involving superior-technology is enhancing the nation's health care costs. Cataracts are a major cause of blindness, especially in elderly people. Fifteen years ago, cataract surgery was painful and not effective all the time. However, due to rapid advancements in the technology, the success rates of the surgery have gone up drastically and is now not as expensive. These two factors have resulted in a meteoric rise in the number of cataract surgeries performed, which has, in turn, driven up the total amount spent on cataract surgery.

Which one of the following can be concluded from the passage above?

- (A) Fifteen years ago, due to the reasons mentioned in the passage, very few people had successful cataract surgery.
- (B) In the long term, the advantages of advanced medical technology will probably be out-weighed by the disadvantages.
- (C) The total amount spent on cataract surgery has increased because the increased number of people choosing to have the surgery more than offsets the decrease in cost per operation.
- (D) Fifteen years ago, cataract surgery was affordable for more people than it was last year.
- (E) Cataract surgery is not required in today's age as the technological advancements that are taking place have made such minor surgeries redundant.

Solution

- (A) This is a close option but not the correct one. This is because 'not very effective' does not translate to 'very few successful surgeries'. These are relative expressions that cannot be quantified.
- (B) This is a very generic inference that is vague and makes far-reaching assumptions.
- (C) This is the correct conclusion. We "conclude" from the passage that even though new technology which restores vision is cheaper due to its success rate; it has resulted in more people going for the surgery which has driven up the costs again. Hence, the total amount of money spent on cataract surgery has increased.
- (D) The passage states the opposite of this.
- (E) This is irrelevant and not connected with the main argument at all.

Inference based questions

Inference questions will ask you to infer or conclude something from the information given in the passage. The literal meaning of *infer* is to conclude something without it being explicitly mentioned. This is exactly what you are required to do on an inference question—arrive at an option that is not explicitly stated in the Passage but that can easily be concluded given the information in it.

Inference vs Assumption

An inference is similar to a conclusion that can be drawn based on one or more elements of the statement. An inference must be true based on something that you read. An assumption is a hidden but necessary piece of evidence. An assumption is something that must be true in order for the argument to be complete and valid.

Inference questions are diametrically opposite to assumption questions. In inference questions, you have to conclude a statement that has to be true. It is not 'perhaps', 'may be', or 'most likely' true, it has to be true. Usually, these inferences are a small step away from the conclusion and in some rare cases it can be an assumption that has to be true. A good trick in these questions is to be biased towards options that use mild words such as perhaps, likely, and so on instead of all, definitely, and so on.

Example 2

Last month three automobile manufacturers—companies H, T and S—launched new models of their respective sedans in Japan. The three models that were launched were similarly priced and had similar features. However, the sales of company S's new sedan have been far lower than those of companies H and T's new sedans in the last month.

The statements above best support which of the following as a conclusion?

- (A) The people in Japan prefer cars manufactured by companies T and H to those manufactured by company S.
- (B) The people in Japan do not like cars manufactured by company S.
- (C) Cars manufactured by company S are notorious for their flimsy build quality and poor fuel efficiency.
- (D) In the last month, company S has earned less revenue from the sale of its new sedan than companies H and T.
- (E) Company D manufactures its cars primarily for the export market and not for domestic sale.

Solution

Do remember that the passage of an Inference question may not necessarily be in the form of an argument. In fact, most often the passage will contain a set of facts like the one above. All that the above passage tells us is that companies H, T and S have each launched a new sedan last month and that the sales of companies H and T's new sedans have been far greater than the sales of company S's new sedan. These are all facts, and the author does not provide any conclusion on the basis of these facts.

With this background, let's go through each of the options in the above question and see if we can arrive at the correct answer:

- (A) This seems very obvious but such inferences must be avoided. For all you know Japanese people might actually prefer company S cars the most but due to some supply constraints company S's new sedan may not be available in the market.
- (B) The earlier explanation applies to this option as well. In fact, this option goes a step further by concluding that Japanese people do not like company S cars at all. Since this may or may not be the case, this cannot be the correct answer.
- (C) This looks very logical because it provides a very convincing reason why the sales of company S's cars have been so low. But is that what we are supposed to do? Absolutely not. So, this option does not even come close to being an Inference. It merely explains why the sales of company S's new sedan may have been low but that is not what we are required to do in the argument.
- (D) The Correct answer. The argument tells us that the three new sedans are similarly priced. Then if company S has sold fewer cars (and by a large margin) than companies H and T, its revenues from the sale of this new sedan have to be lower than those of companies H and T. This option must be true in all cases and hence has to be the correct answer.

- (E) Like option C, this option again provides a logical explanation for company S's low sales in Japan but this may or may not be the case. In any case we are not required to provide an explanation in the first place. So, this cannot be a valid inference.

Assumption based questions

As the name suggests, you will be given an argument in the question stem and you will need to identify the assumption that is made in this argument from the five options given to you. Let us take a look at an example:

Example 3

Over the last six years, most of the students in Tupac city have regularly attended colleges in the neighbouring Mekon city to pursue their graduate degrees. However, according to a recent change in the education policies of Mekon city, the colleges in Mekon city are expected to increase their fees to almost the same level as those charged by colleges in Tupac city. Therefore, it can be safely concluded that colleges in Tupac city will see a surge in the number of students enrolling with them to pursue their graduate degrees.

Which of the following is an assumption on which the argument depends?

- (A) The teachers at colleges in Mekon city are generally considered far superior to those at colleges in Tupac city.
- (B) Tupac city does not have good quality colleges.
- (C) The low fees charged by colleges at Mekon city is the primary reason why students from Tupac city move to these colleges.
- (D) Students who study at colleges in Tupac city do not perform better than those who study at colleges in Mekon city.
- (E) Mekon city does not have more colleges than Tupac city.

Solution

Always start an assumption question by paraphrasing the conclusion and the evidence.

- **Conclusion (What is the author saying?)**—that there will be a surge in the enrolments at colleges in Tupac city.
- **Evidence (Why is the author saying this?)**—because students in Tupac city who earlier used to move to Mekon city to pursue their graduate degrees will now not do so as the colleges in Mekon city will charge them the same fees as the colleges in Tupac city do.

Note that that conclusion is an opinion of the author but the evidence is a fact because the colleges in Mekon city are definitely looking at increasing their fees.

- **Assumption**—The author must be assuming that the low fees charged by colleges in Mekon city is the single most important factor why students from Tupac city have been moving to colleges in Mekon city. If we don't assume this, the argument will fall apart. Thus, C is the correct answer.

Strengthen and weaken the argument questions

Strengthening an Argument

The key to strengthening an argument is finding the answer choice that reinforces the premises or the central assumption in some way. This can be done in two ways-

- First, the assumption might be rephrased and presented as an answer choice. In this case, it becomes a strong argument.
- Second, the correct answer can be a validation of the assumption through the citing of a study, survey or any other relevant piece of additional evidence that makes the assumption more likely to be true.

Essentially, any information that fills the gap present in the logic of the argument with extra information (that supports the conclusion made in the argument) strengthens it.

Weakening an Argument

Finding a statement that weakens an argument follows the same process, only backwards.

- First, any statement that rebuts the assumption shall weaken the argument.
- Second, Data, information, reasoning, facts and so on that disprove or challenge the assumptions or premises used in the argument shall weaken it.

In these questions, an argument will be given to you and you will need to select from five options the one option which strengthens or weakens the argument (depending on what the question asks you to do). Let's take a look at an example of each:

Example 4

Of all the laptops available for sale in Ireland, those manufactured by Ivy Infotech must have the fastest processors. Over the last six months, Ivy Infotech has sold three times as many laptops as its closest competitor. Additionally, Ivy Infotech's order books are full for the next 12 months.

Which of the following options, if true, most strengthens the argument?

- (A) Ivy Infotech is the oldest manufacturer of laptops in Ireland.
- (B) Ivy Infotech has the largest market share in laptop sales in Ireland for the past five years.
- (C) Ivy Infotech sources its processors from the company which is the world's biggest manufacturer of laptop processors.
- (D) All the laptops available for sale in Ireland are the same in every aspect, except for their processors.
- (E) Due to production bottlenecks, the production of laptops by Ivy Infotech's rival companies fell by more than 60% in the last six months.

Solution

Since this is a strengthen question, you know that it will be worded in the form of an argument. So the first step is to identify the conclusion and the evidence of this argument.

- **Conclusion (What is the argument stating?)**—Laptops manufactured by Ivy Infotech have the fastest processors.
- **Evidence (Why is the argument stating this?)**—Because Ivy Infotech has sold the maximum number of laptops in the last six months in Ireland.

But does this make sense? Can't there be some other plausible reason why the people in Ireland are buying Ivy Infotech's laptops?

- Maybe these laptops have a very sleek design, maybe they have a very long battery life, or maybe they are the cheapest laptops in the market. There can be several other reasons (other than fast processors) why the Irish are buying laptops manufactured by Ivy Infotech. This brings us to the assumption. Remember that since the passage is in the form of an argument, it must contain an assumption.
- **Assumption (the unstated evidence)**—So let's try to predict the assumption. It will be something along the lines of 'the only difference among the different laptops available in Ireland is the speed of the processor; the laptops are the same in every other aspect', because then if the people are still buying Ivy Infotech's laptops these laptops must have the fastest processors, else people would be buying some other company's laptops.
- **Strengtheners**—So now that we have identified the conclusion, the evidence, and the assumption, the option that tells us that the assumption is true has to strengthen the argument. (D) does this best and should be the correct answer.
- **Weaker**—Similarly, the option that best tells us that the assumption may NOT be true has to weaken the argument. In essence, this option will provide us with some other reason

(other than faster processors) why the sales of Ivy Infotech's laptops have been very high. (E) does this best as it gives us an alternative reason why people might be buying Ivy Infotech laptops—because the laptops of other brands are in short supply—and not because Ivy Infotech laptops have the fastest processors.

Miscellaneous question types

Explain the paradox

Example 5

Kamlesh: It is quite surprising that junk food consumption has increased by 20% from last year.

Kavita: What is so surprising about that? As it was last year, junk food is still popular.

Kamlesh: The Government of India has been putting in sustained efforts to publicise the harmful effects of junk food since last year. So I expected junk food consumption to go down.

Which of the following responses can Kavita make to resolve the paradox?

- (A) Junk food consumption has steadily increased every year.
- (B) Kamlesh and Kavita rarely eat junk food.
- (C) Currently, the youth in the country are very health conscious and regularly watch what they eat.
- (D) Most people eat junk food because it is served quickly and can be eaten while travelling.
- (E) Junk food consumption is restricted to a particular segment of society.

Solution

Step 1: Read the question stem.

Which of the following responses can Kavita make to resolve the paradox? Resolving paradoxes are very similar to 'Weakening the Argument' questions. Think about it. The paradox exists because the author has made some conclusion that the premise does not support.

Step 2: As usual, we will focus on Conclusion-Premise-Assumption.

Remember that you now need to state the assumption negatively to weaken the argument.

Conclusion / What?: It is quite surprising that junk food consumption has increased by 20% from last year.

Premise / Why?: The government of India has been putting in sustained efforts to publicize the harmful effects of junk food since last year.

Step 3: State what a good answer can look like.

Assumption: Kamlesh is assuming that just because something has been deemed unhealthy, people will stop eating it. We need to negate this assumption, we can do this by introducing another cause.

Step 4: Eliminate the incorrect answer choices.

(A) Junk food consumption has steadily increased every year.

Increase in junk food do not explain why junk food consumption is rising despite campaigns to discourage junk food consumption.

(B) Kamlesh and Kavita rarely eat junk food.

What Kamlesh and Kavita do in their personal life cannot explain aggregate figures for junk food consumption.

(C) Currently, the youth in the country are very health conscious and regularly watch what they eat.

This actually intensifies the paradox because if people are health conscious then they will reduce their junk food consumption.

- (D) Most people eat junk food because it is served quickly and can be eaten while travelling.

This introduces a new reason as to why people prefer junk food. Hence it negates the assumption that Kamlesh makes and helps in explaining the paradox.

- (E) Junk food consumption is restricted to a particular segment of society.

Just like option (C), this option also strengthens the paradox. If consumption of junk food is restricted to a specific segment of society then its use should remain stable and not increase.

The correct answer is option D.

Parallel the reasoning

Example 6

The fear of contracting swine flu is very high in Asian countries. If only these people could compare the number of people who actually contract swine flu (very few) with the number of people who actually contract the common cold (high), then this fear would be assuaged.

Which of the following is most closely similar to the reasoning used in the argument above?

- (A) I do not understand why people fear cockroaches even if they are numerous; the real danger lies with tigers even though they are few.
- (B) I do not understand why people fear cockroaches even if they are numerous; the real danger lies with tigers because they are too numerous to count.
- (C) I do not understand why people fear cockroaches, they are very few; the real danger lies with tigers because they are too numerous to count.
- (D) I do not understand why people fear cockroaches, they are very few; the real danger lies with tigers because though they are few they can hide in the unlikeliest of places.
- (E) I do not understand why people fear cockroaches even if they are few; the real danger lies with tigers as they are few.

Solution

Step 1: Read the question stem.

Which of the following is most similar to the reasoning used in the argument above?

Pay close attention to how the original argument is structured, you will have to replicate the same structure in the answer.

Step 2: Find the structure of the original argument.

The original argument states that you should not fear something because it occurs rarely, instead you should fear the things that occur a greater number of times.

Step 3: State what a good answer can look like.

The fear for tigers is very high in Asian countries. If only these people could contrast the number of tigers (very few) with the number of cockroaches (high) then this fear would be assuaged.

Of course, we should not have pre-conceived notions about tigers and cockroaches. Hence the answer can easily look like this:

The fear for cockroaches is very high in Asian countries. If only these people could contrast the number of cockroaches (very few) with the number of tigers (high) then this fear would be assuaged.

Step 4: Eliminate the incorrect answer choices.

From the above step, the answer clearly has to be (C).

The correct answer is option C.

Tips for solving questions on critical reasoning

1. Start by reading the question stem.

Doing this shall allow you to identify the type of question (Assumption, Strengthen, Weaken, Inference, and so on). This shall let you categorise the different elements of the argument structure, for example, the premises, the assumption and the conclusion.

2. Try to predict the answer before looking at the options.

It is not necessary to have a detailed solution, but a generic statement or a broad outline/framework will help point you in the right direction by eliminating choices.

3. Analyse the given answer choices.

Carefully read through all 5 answer choices. While doing so, compare these choices with your prediction. There will be certain choices that can be eliminated upfront – they will either be beyond the scope of the argument, too narrow in their construction or too vague and so on. Once you have eliminated 2–3 options through this process, the remaining 2–3 options can then be evaluated on the basis of their correctness.

4. Avoid options that are extreme or exaggerated in their construction.

For an option to be the correct answer, it must always hold true within the context of the argument. However, one should be cautious of modifiers that amplify one aspect of the premise or make overstatements. They usually signify an incorrect answer. For example, if the argument states that “certain phones made by the company were defective”, then an answer choice that claims that “most of the phones made by the company were defective.” Will be incorrect. Also, beware of extreme words like “always”, “only”, “never”, “none” and so on. Usually, these options will be incorrect.

5. Be conscious of a change in the scope of the argument.

Scope refers to the specific aspects of a topic. For example, the topic of a passage may be “Bollywood” and its scope may be “the changing face of the female lead over the years”. Thus, the scope is a more specific, narrower delineation of the topic. In critical reasoning questions, it is extremely important to identify those answer choices that shift the scope of the argument, albeit slightly.

For example, the passage may present a study that claims that there has been an increase in the natural disasters plaguing the state of Uttarakhand. In this case, an answer choice that talks about the increased number of earthquakes in the state, though tempting, will actually be incorrect. This is because natural calamities are not restricted to earthquakes only. This alters the scope of the initial argument.

6.5 Deductions

6.6 What is Measured?

This section will test you on your ability to use logic to evaluate the strength of arguments, draw assumptions and inferences from statements, evaluate effective courses of action and so on.

This section focuses on the analysis and interpretation of various statements— with respect to their structure and application.

6.7 Overall Test Taking Strategies

1. Logic does not mean common sense. So, do not use common sense or any outside information while answering questions. Only focus on the statement and options given to you.
2. Read the question carefully and watch out for terms such as must, always, could, might and so on, as these could define the difference between a correct and an incorrect answer choice.
3. Avoid extreme options in Inference-based questions.

1 Introduction

Logic, which derives from the Ancient Greek word, *logike* refers to the systematic study of the various kinds of arguments. A valid argument is one where there is a logical, rational correlation between the assumptions made in the argument and the conclusions derived.

Questions based on reasoning are regularly asked in NMAT by GMAC™ and are quite challenging. Their difficulty level is higher as compared to the other management entrance examinations and comprehensive practice across the various question types is required in order to enhance one's accuracy level.



Important Learning: Complete the practice tests to improve your comfort level with the various types of questions. This shall also help ascertain areas that prove challenging with respect to comprehension and analysis. Identify these question stems and practice extensively. Use the method of elimination in order to arrive at the correct solution.

Deductions are an integral part of competitive exams. They aim to measure a candidate's ability to draw logical conclusions based on statements or arguments, and to identify the strengths and weaknesses of those arguments. It is important to keep in mind that the statements and assumptions in logical reasoning might defy your expectations rooted in the real world.

For instance, consider the statement: Eating a lot makes you lose weight. (*This goes against the general knowledge that eating a lot leads to obesity, but within the limits of logical reasoning, this is a valid argument.*)

Now, if we state that Rahul has lost weight, then based on the information provided we can conclude that Rahul eats a lot.

These questions will, in part, test your language or comprehension skills. You will only be able to ascertain the correct answer if you are able to comprehend the argument or question correctly.

Questions based on reasoning are mostly on the application of the two types of logic:

- (a) Deductive logic
- (b) Inductive logic

(a) *Deductive logic*

Deductive logic, also known as the “**from the top down**” **approach**, starts with a general idea and works down to the details. It is a basic form of valid reasoning. As stated above, it starts out with a general statement, or hypothesis, and examines the possibilities to reach a specific, logical conclusion.

Deductive reasoning usually follows steps. There is a set of premises followed by a conclusion. Syllogisms constitute a common manifestation of deductive reasoning wherein two statements are given and a conclusion is drawn on the information provided in these statements. For example, the premise “All A is B” could be followed by another premise, “All C is A.” These statements would lead to the conclusion “All C is B.” Syllogisms are considered an effective tool to assess the validity of an argument.

For example, “All women are intelligent. Anna is a woman. Therefore, Anna is beautiful.” For deductive reasoning to be valid, the hypothesis must be correct. The premises are assumed to be true. Hence, the conclusion is logical and true. In deductive reasoning, if something is true of a class of things in general, it is also true for all members of that class. Questions based on necessary and sufficient conditions also use deductive reasoning.

(b) *Inductive logic*

Inductive logic, also known as the “**from the bottom up**” **approach** reasoning, is different from deductive logic in which the reasoning is based on possibilities, not on certainties. Inductive reasoning draws generic conclusions from specific information. Essentially, broad inferences are drawn from a specific piece of data. This is called inductive logic.

Inductive reasoning allows for the possibility of the conclusion to be tentative, even though some other conclusion that is contrapositive may also be true. For example: “Rekha is a teacher. Rekha is tall. All teachers are tall.” This may or may not be correct.

(c) *Common types of Deduction based questions are:*

- (i) Statement-Conclusion Questions
- (ii) Statement-Assumption Questions
- (iii) Statement-Course of Action Questions
- (iv) Fact-Analysis Questions
- (v) Statement-Argument Questions

2 Statement and Conclusion Questions

A conclusion is something that is not directly stated but can be implied from the given information. An inference, on the other hand, is an extension of an argument, not a necessary part of it.

A conclusion is similar to an inference. For example, if we say that *Raghav is the most intelligent student in his class*, then from this statement we can easily conclude that Vivek, who studies in the same class, is not as intelligent as Raghav. Note that we have arrived at this conclusion even though Vivek is not explicitly mentioned anywhere in the statement.

The difficulty with conclusion questions is that we always have a tendency to over infer by reading too much between the lines or by using our own knowledge to answer questions. You must avoid doing these two things.

Tips for approaching conclusion questions

Usually in Critical Reasoning questions, the argument comprises both a premise and assumptions. In Conclusion Questions you are required to draw a conclusion based on the information given. Generally, conclusion based questions adopt the following structure:

- (a) The statements above, if true, best support which of the following as a conclusion?
- (b) Which of the following inferences is best supported by the statement made above?
- (c) Which of the following conclusions can most properly be drawn from the information above?
- (d) If the statements above are true, which of the following must be true?

A key point to be remembered is that the correct answer choice is ***the one that extends the premises a step further***. Moreover, it should be in the same tone (positive, negative, neutral) that comes across in the argument.

Things to keep in mind for conclusion questions:

- (a) These questions test your ability to analyse and interpret a set of statements.
- (b) Answers with extreme wordings should be avoided. Conclusion answers typically do not use *only*, *always*, *never*, *best* or *any strong words* that present extreme scenarios. The right answers on conclusion questions will generally use more qualifiers and less extreme language.
- (c) Try to fully understand what the passage's point is and the exact reasoning so that if the question asks you to extend that reasoning, you are able to do so accurately.
- (d) Use the process of elimination. Conclusion questions typically have two or three good answers. The best way to tackle these questions is to gradually eliminate the possible answers until you have one or two and then choose the last one by scope.
- (e) An option which is not a correct conclusion may seem very close but will challenge the premise/given conclusion in some way or another.

Types of questions

Questions with two conclusions

Here is how the answer choices typically look in a conclusion question:

- (A) Only I can be concluded
- (B) Only II can be concluded
- (C) Either I or II can be concluded
- (D) Neither I nor II can be concluded
- (E) Both I and II can be concluded

Let us take a look at an example:

Statement: With TV channels and other media broadcasting news, there has been an alarming decline in newspaper reading habits, especially among the younger generation.

Conclusion I: Reading of newspapers should be encouraged.

Conclusion II: TV news is better than newspaper news.

Solution

The statement says 'alarming decline', which makes conclusion I a valid conclusion. Conclusion II is not valid.

The correct answer is A.

Questions with more than two conclusions

You can even get questions with more than two conclusions associated with them. Let us take a look at an example:

Statement: All those who had passed the eligibility test were jobs as teachers in government schools.

Conclusion I: All those who were given jobs as teachers in gov schools had passed the eligibility test.

Conclusion II: No government school now is without teachers v not passed the eligibility test.

Conclusion III: Some government schools now have teachers w passed the eligibility test.

Conclusion IV: No school earlier had teachers who had passed eligibility test.

- (A) Only I can be concluded
- (B) Only II can be concluded
- (C) Only III can be concluded
- (D) Only I and III can be concluded
- (E) Only III and IV can be concluded

Solution

Although all those who had passed the eligibility test were given jobs, jobs could also have been given to some people who had not passed the eligibility test. We also do not know if the number of people who passed the eligibility test was big enough to fill positions in all schools. Also, we cannot conclude anything about the situation before this particular event about given jobs to people who had passed the test.

The correct answer is C.

3 Statement and Assumption Questions

An assumption is an unstated premise that supports the conclusion. An assumption provides logical support to the given statement of the question. In other words, we can say that an assumption is a concept, thought or view that is considered to be true and taken for granted. An assumption is the hidden part of a statement that is neither directly explained nor explicit. It is implicit in the flow of the argument.

Both premise and assumption are unquestionable facts but the assumption, unlike the premise, is not explicitly stated and needs to be deciphered. Assumption is something that is taken for granted in the context of a statement. For instance, 'All kids are happy when they get new gadgets. Therefore, Vicky will be happy when he gets the new mobile phone.' In this, the assumption is that Vicky is a kid. Without this assumption, the argument will make no sense. We can also assume that mobile phone is a gadget.

Questions with statements and assumptions are common in the logical reasoning section of entrance examinations. An assumption question asks you to identify an unstated premise of the statement. As you read the statement, try and identify a gap in the underlying argument. The gap can only be closed by stating out aloud what is now being assumed.

Identifying an assumption

While saying something, a person does not state each and every aspect of his/her views. There are many things, views, thoughts, and so on that remain unsaid. These 'unsaid' things, views, thoughts, and so on are considered as 'assumptions'.

An assumption is an important part of any argument. Almost all arguments are based on some assumption or the other. The most important aspect of assumptions is that they are implicit, that is, they will never be written explicitly in the statement/argument. However, the assumption must be true for the argument's conclusion to be true.

Testing an assumption

One of the most effective methods to solve questions based on assumptions is the 'negating method'. Any communication, be it written or verbal, makes certain assumptions. These 'certain' assumptions are the very foundation of the argument. This means that if we believe the argument to be valid, the assumptions also have to hold true. Thus, in order to ascertain whether something is, in fact, an assumption, you just have to negate it. If the negation does not impact the central argument being made by the author, the said statement is not an assumption. If however, upon negating the statement, the logic of the argument collapses, then the statement is a central assumption, critical to the author's argument. For example, consider the statements given below:

Statement: In the recently held Doctors' conference, the session on 'Ethics in medicine' surprisingly attracted a large number of participants and also received extensive media coverage.

Assumption I: Media is always very positive towards the issue in medicine.

Assumption II: The medical sector in India is known for its ethical practices.

Assumption III: Such a large participation was not expected.

Now, the Statement talks about a particular session in the Doctors' conference which got many participants and media coverage. All of this was surprising for the author.

Let's consider the different assumptions:

1. 'Media is always very positive towards the issue of ethics in medicine': it is tempting to select this option as an answer because the media gave extensive coverage to the session so one might think that the media is ALWAYS positive towards it. But that's not true, as the author has expressed

surprise over the extensive media coverage. That means that this behaviour is new as per the author.

2. 'The medical sector in India is known for its ethical practices': we cannot take any decision with respect to this particular assumption. On one hand, it is possible that the session is being organised because these practices are well established, but, on the other hand, it is also likely that the session is being conducted to increase awareness about ethics. As it's not stated anywhere in the sentence so this is, definitely, not the author's assumption.
3. 'Such a large participation was not expected': this assumption is, indeed, true. Since the author is surprised by the response (Public participation plus media coverage) then it is fair to assume that it was not expected. *Note: Use the keyword 'surprisingly' to identify the assumption.*

We have just demonstrated how to attempt questions that ask you to identify the assumption underlying the statement. Please note that it is important to stay within the confines of the argument and not apply external knowledge to the question at hand.

Types of questions

Questions with two assumptions

In assumption questions on the NMAT by GMAC™, a statement will be given to you and two possible assumptions will be written below it. The answer choices will look something like this:

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (D) Neither I nor II is an assumption
- (E) Both I and II are assumptions

Let us look at an example:

Statement: Since the CEO is going on a one-month leave, asked the CFO to take over the operations of the company for that period.

Assumption I: The CFO has the necessary skills to run the company effectively.

Assumption II: The CFO may not accept the request of the CEO.

Solution

If the CFO is being asked to take charge of the company, it is definitely implied that he has the skills to do so. Thus, Assumption I is a valid assumption. Whether the CFO accepts the offer or not is in no way implicit in the given statement. Thus, Assumption II is not a valid assumption.

The correct answer is A.

Tips for approaching assumption questions

Building Proficiency in the Question Type

- (a) **Step I:** Review the theoretical concepts given at the beginning of the chapter. Study the examples and understand the application of principles.
- (b) **Step II:** After reviewing the theory, start practising the questions given in the book. At this point in time, focus on quality and not quantity. This means, attempt a limited number of questions each day, analyse your responses and redefine your strategy. Always try and use the 'negation method' for solving these questions.

You have to work as a detective and find out the hidden premise which is the assumption through a critical analysis of the data provided in the argument. Keep in mind these four rules before you start:

- (a) Use only the data that is provided in the argument. Do not utilise outside knowledge unless specifically mentioned.
- (b) Always consider the statements and assumptions to be true. Do not judge them based on your own conception of absurdity.
- (c) An assumption is not a reiteration of an already stated premise.
- (d) Choose the most appropriate answer based on a valid reasoning keeping in mind the following elements:
 - (i) Assumption must always be true.
 - (ii) Look out for words such as *only*, *best*, *always* and so on. These words reduce the chances of an option being a valid assumption.
 - (iii) Watch out for connecting words as they could show an implicit similarity, such as *similarly*, *likewise*, or a contrast, such as *yet*, *however*, *nonetheless*.
 - (iv) *Most* does not mean *all*.

- (v) *Many* does not mean *most*.
- (vi) The Assumption *must* be implicit in the given statement.
If it *may* or *may not* be implicit, then it is not a valid assumption.

Let us look at one more example:

Statement: Organisations should promote people based on their contribution to the company and not on the duration of their service within the company.

Assumption I: The duration of service is not a reflection of the contribution that an employee has made to the company.

Assumption II: It is possible to empirically measure the contribution each employee has made to the company.

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (D) Neither I nor II is an assumption
- (E) Both I and II are assumptions

Solution

Since the statement concludes that the length of service should not be the criteria used to determine whether to promote a person or not, it is obviously being assumed that there is no direct correlation between the length of service and the contribution an individual has made to the company. So I is an assumption. Again, when the statement concludes that promotions should be based on the contribution of each person to the organisation, it assumes that such contributions can be empirically measured. Thus, both the assumptions are implied in the argument.

The correct answer is E.

4 Statement and Course of Action

In questions on Course of Action, you have to read the statement, analyse it, identify its cause and decide on an apt course of action that should be followed in that situation. A suggested course of action should be practical, pragmatic and connect with the realistic aspect of life.

Structure of the questions

Part 1: Statement

As the name suggests, there will be a statement that will define the problem. You have to read the statement and identify the underlying problem.

Part 2: Course of Action

This part shall contain possible solutions or decisions that can be taken with respect to the problem. The candidate has to decide which course of action logically follows the situation and can be adopted.

Sometimes, it might be difficult to figure out the right course of action but these can be solved quite easily with the help of a logical mind frame.

Pattern of questions

There are two types of question patterns. The first one is based on a problem and suggested course of action which can help in the resolution of the problem. The second one includes a fact or situation and suggested courses of action which could improve the situation. So, while attempting this segment, first decide whether the given statement is based on a problem or is describing a fact/situation.

In **Problem and Solution based pattern**, the given statement presents a problem and the suggested course of action presents solutions which can be accepted as appropriate, if they solve or minimise the problem and are practically possible. We have to keep in mind that a prescribed course of action that solves the problem, but is not practically possible is of no use and must definitely be rejected.

Statement

There is a widespread waterlogging in the city after the recent heavy rains and large parts of the city are inundated.

Courses of Action:

- I. Pumping out water from affected areas must be started immediately.
- II. The municipal corporation should invite suggestions to prevent recurrence of the situation.

Mark your answer as follows:

- (A) If only I follows.
- (B) If only II follows.
- (C) If either I or II follows.
- (D) If neither I nor II follows.
- (E) If both I and II follow.

Solution

The statement mentions two problems – waterlogging and inundation caused by rains. Since nothing can be done about the rains, we need to have solutions to get relief from waterlogging. Also, the *problem is urgent*, and hence requires a solution that will work and get results immediately. Action I is a valid course of action while action II is a long-term suggestion that will not get any solution to the *present problem*. Hence, the best choice is option (A).

The correct answer is A.

In Fact and Improvement based pattern, the given statement provides a simple fact and the suggested course of action suggests ways to improve the condition.

Types of questions

Questions with two courses of actions to choose from

In this question type, you will be given a statement followed by two courses of action or decisions. You will be required to analyse the situation and then decide which of the two decisions to take. The choices will typically read as follows:

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Either I or II should be pursued
- (D) Neither I nor II should be pursued
- (E) Both I and II should be pursued

Let us take a look at an example:

Statement: Researchers are feeling agitated as libraries are equipped to provide the right information to the right users at the right time in the required format. Even though users are not aware about the various services available for them.

Courses of Action I All the information available to the libraries should be computerised to provide faster services to the users.

Courses of Action II Library staff should be trained in computer operation.

Solution

Clearly, the library needs to be provided with the essential facilities and trained personnel for better services. So, both the courses follow.

The correct answer is E.

Questions with three courses of actions to choose from

You can sometimes also get three courses of actions to choose from. Let us take a look at an example:

Statement: Workers shifting from villages to cities in large numbers as has been observed recently, is an unhealthy trend.

Course of Action I Firms in cities should be barred from hiring rural workers.

Course of Action II It should be compulsory for workers in cities to spend some time in rural areas for some duration.

Course of Action III New schemes that can help generate employment in rural areas should be launched.

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Only I and III should be pursued
- (D) All should be pursued
- (E) Only III should be pursued

Solution

Forcing someone to work in rural areas or barring rural workers from working in cities is definitely not a solution to the problem at hand. The solution is to try to understand why this migration is taking place in the first place—most likely because of better employment opportunities in the cities. So, the ideal solution should be to address this problem, which only III does.

The correct answer is E.

Let us take a look at another example:

Statement: There has been a continuous increase in the number of dropout students of government-run primary schools in the state.

Courses of Action I Government should immediately set up a committee to review the situation and suggest measures to reverse the trend.

Courses of Action II Government should conduct orientation program for parents of the students, emphasising the need for educating their children.

Courses of Action III Government should close down such state-run primary schools, where dropout rates are more than fifty percent.

- (A) Only I follows
- (B) Only II follows
- (C) Only III follows
- (D) I and II follow
- (E) None of these

Solution

The government should set up a committee to review the case and suggest measures to resolve the issue. So, the first action follows. Also, orientation programmes should be conducted for parents of the students to emphasise the need of education for their children. Closing such state-run primary schools, where dropout rates are more than fifty percent is not the correct option as it will not solve the problem and will not help the government in fulfilling its motive.

The correct answer is D.

Tips for solving questions on Course of Action

1. Make sure you arrive at an objective course of action using only the facts given to you in the statement. Do not let your own knowledge or preconceived notions about the subject matter affect your decision making.
2. In such questions, one must opt for the ideal solution. Therefore, if the choice is between practical and ideal, choose ideal.
3. The correct answers always exhibit one, many or all of the following characteristics:
 - They are ethical even if they involve a cost.
 - They are also practical and not merely idealistic or 'feel good'.
 - They do NOT favour a particular side in a disputed situation.
 - They are balanced and seek to provide solutions where required.
 - Avoid an extreme choice at all costs.
4. These questions always work on the premise of the greater good for the greatest number involved. This is true especially when one has to choose between the benefits to organisations/institutions over individuals. An action benefitting a larger population is a desirable action even though it may put an extra burden on the organisation/institutions or government.
5. Make decisions in sync with the way the system and public departments function.
6. Existing practices are not considered an effective course of action.
7. Our decisions and views should be unbiased and neutral.
8. Try to select the course of action that addresses the central cause of the problem.
9. Extreme or strict action is not a valid course of action.
10. The actions should always be a positive.
11. The selected course of action should not aggravate the problem or create a new set of problems.

- 12.** If in any situation, more than one course of actions is possible (but are dependent on each other), then your answer should always be “both follow” and not “either of them follows”.
- 13.** The course of action can be said to solve/reduce the problem when it is an established fact, when it is logically possible and when it is known from experience.
- 14.** Lastly, if there are dates or figures involved, those will certainly have a bearing on the answers.

5 Fact Analysis

Fact Analysis questions on the NMAT by GMAC™ involve the application of the principles of statement-conclusion on a set of factual data. Fact-based conclusion questions are those that test your ability to draw sound and logical conclusions based on a set of data/ facts provided. Essentially, you are given a set of facts on the basis of which certain assertions are made. The candidate is required to identify the set of assertions that can be proven conclusively by the given facts.

One thing to be kept in mind while solving these questions is that all conclusions and decisions should be drawn purely from the given set of facts. A statement will be said to follow the given facts if it can be inferred conclusively from them.

We can make use of the following in assessing the facts:

Keywords

Any word that helps to delineate the meaning of a sentence acts as a keyword. These words help evaluate the given statements with respect to:

1. Scope– Universal/Specific
2. Charge
3. Main Idea
4. Tone

In a statement pay special attention to words like– all, no, few, most, must, had to, will be, always, never, should be, may, may not, only and so on. These will help you assess the facts and arrive at the correct conclusion. Let us consider an example:

Example 1

Facts:

- Fact 1:** Graphics can tell news.
- Fact 2:** All newspapers have graphics.
- Fact 3:** Some newspapers have text.

Statements:

- I. Some newspapers have both text and graphics.
 - II. Graphics can tell news better than text can.
 - III. The news in newspapers is very interesting.
- (A) Only I can be concluded.
 - (B) Only II can be concluded.
 - (C) Only III can be concluded.
 - (D) Both II and III can be concluded.
 - (E) None of the statements can be concluded.

Solution

Statement I can be concluded from Fact 2 and 3. Those newspapers which have text will have both text and graphics. Statements II and III cannot be concluded as there is no information about the efficacy of text in telling news.

The correct answer is A.

Application of logic

The conclusion may not follow the given statement directly, but by application of logic we can evaluate the conclusion. Let us consider the following examples.

Example 2

Facts:

Fact 1: World Bank has proposed a loan of 1000 million dollars for South Africa.

Fact 2: Apprehensions about erosion in the agriculturists' vote bank prevented the ruling party from accepting the World Bank proposal.

Fact 3: The opposition has criticised the decision of the government.

Statements:

- I. The proposal is pro-industrialists.
 - II. The proposal is anti-agriculturists.
 - III. The opposition party is anti-agriculturist.
- A. Only I can be concluded.
 - B. Only II can be concluded.
 - C. Only III can be concluded.
 - D. Both I and III can be concluded.
 - E. None of the statements can be concluded.

Solution

From the facts it is clear that the South African government rejected the proposal to appease agriculturists. But we can't draw any conclusions about whom the proposal favors. Hence, we cannot conclude that the proposal is in favor of industrialists. Thus, statement I does not follow. But it can be inferred that the proposal is not in favor of agriculturists. Hence, statement II follows. However, the fact that the main opposition party has criticised the government's decision does not mean that the party is anti-agriculturists. It is possible that they have a different perspective or believe that the proposal actually benefits the farmers. It is also possible that they might be opposing the ruling party out of spite. Hence, statement III does not follow.

Let us consider a final example:

Example 3

The new CEO of a Research facility met with its Security In-charge to assess the security protocols in place. During the meeting, the following facts were gathered:

- Fact 1:** The research facility must have at least one supervisor on duty 24 hours a day, seven days a week, to satisfy Central and State labour regulations.
- Fact 2:** To maximise operational efficiency, there must be exactly 10 security guards manning the facility.
- Fact 3:** The facility operates from 8am until 5pm, Monday to Sunday. The security guards are required for this duration only.
- Fact 4:** The facility employs 4 supervisors and 16 security guards making the total strength of the security team 20.
- Fact 5:** Total weekly employee cost for the security team is \$16,000.

Statements:

- I. One fifth of the total cost of the security team is for supervisors.
 - II. At least one supervisor must work more than 40 hours per week.
 - III. The security guards do not work more than 40 hours per week.
 - IV. The majority of the security team's employee cost is due to the guards.
- (A) Only I can be concluded.
 - (B) Only II can be concluded.
 - (C) Only III can be concluded.
 - (D) Both I and III can be concluded.
 - (E) None of the statements can be concluded.

Let us analyse the different options:

- (A) There are 4 supervisors out of 20 security guards so it seems likely that the cost of a supervisor will be $1 / 5$ of the total cost. But such an analysis assumes a very important piece of information— that every person gets the same salary. Since we don't know this for a fact, this conclusion can't be drawn.
- (B) This can be concluded based on the provided facts. As per the facts, the research facility must have at least one supervisor on duty 24 hours a day, seven days a week to satisfy Central and State labour regulations. Thus, a total of $24 \times 7 = 168$ supervisor hours are needed in a week, which equals 42 hours per week per supervisor. So, there has to be one supervisor who works more than 40 hours.
- (C) The facility opens for 9 hours every day, 7 days per week, and there must be exactly 10 guards working at a time: this translates to 630-man hours per week. There are 16 guards, so on an average each guard must work only 39 hours per week. This seems to fit very well with the proposed

conclusion: security guards do not work more than 40 hours per week. But we don't know whether every security guard works the same amount of time (It is possible that some guards work for more than 40 hours while others work for lesser number of hours)

- (D) As explained in A, there are more security guards, so it is easy to conclude that the total cost for security guards is more than the total cost for supervisors. But such a conclusion makes the same assumption- that every person earns the same amount. Hence, this is also incorrect.

Thus, only option B can be concluded.

6 Statement and Argument Questions

A statement that is used to support a proposition or statement in favour or against is called an argument. It is irrelevant whether an argument is favourable or adverse to a proposition. Both favourable & adverse arguments are considered as strong enough in their own ways.

Strong arguments are those that are directly connected to the subject matter in the given statement and that help you strengthen or support that statement. Weak arguments, on the other hand, are either not connected to the subject matter at all or they are connected to it in a very indirect and far-fetched manner. Let us understand these concepts in detail.

Structure of an argument

Let us understand the structure of an argument with the help of an example:

People don't like to visit the Evergreen wildlife park in the rainy season. This year the park authorities have reconstructed all the roads inside the park, so people will like to visit the Evergreen Park in the rainy season this year.

Conclusion—This is the point of the argument and answers the question *What*, that is, what the argument is basically stating—*that people would like to visit the Evergreen Wildlife park in the rainy season this year.*

Conclusions usually follow signalling words such as *thus*, *so*, *hence*, *therefore*, and so on. In case there are no such words in the argument, try to paraphrase the entire argument in one line. This line would almost always be the conclusion of the argument.

Evidence—While the Conclusion tells you *What* the argument is saying, the Evidence tells you *Why* the argument is concluding what it is concluding. So in the above argument, why does the author conclude that people will like to visit the Evergreen Park this year? Because the park authorities have reconstructed all the roads inside the park, so this becomes your evidence.

Evidence usually follows signalling words such as *because*, *since*, *as a result of*, and so on.

So the conclusion tells you the *what* of the argument and the evidence tells you the *why* of the argument. Another way of looking at conclusion and evidence is that a conclusion will almost always be *an opinion* whereas the evidence will almost always be a fact. In the above argument it is a fact that the roads have been reconstructed but it is the author's opinion that people will like to visit the Evergreen Park this year.

Assumption—Now, going back to the above argument, notice that from the given evidence we cannot necessarily arrive at the

stated conclusion. The argument only states that people don't want to visit the Evergreen Park during the rainy season; it never states why people don't like to do so. So the author *assumes* that the only reason people don't like to visit the park is because of the poor road conditions within the park. If this is not assumed then the argument will fall apart.

For example, if the real reason why people do not visit the Evergreen Park was the fact that there are hardly any animals in the park, then even if the roads were of best quality, people will not visit the park because bad roads was not the reason for people not visiting the park in the first place. So, for the author to conclude that people will want to visit the park this year, he has to assume that the only reason people did not visit the park earlier was the poor road conditions inside the park.

Identifying an argument

How to identify an argument as strong or weak?

Strong Argument: Statements that reinforce/build on the idea discussed through the use of reasons, facts, and examples.

Strong argument provides a valid and directly related reason either in favour of or against the proposal made.

- A strong argument provides a sensible and acceptable argument that either supports or opposes the proposition.
- It is supported by the given facts or established notions.
- An argument based on Universal Truth is always strong.

Weak Argument: Statements that present data, facts, reasoning that either contradicts or dilutes the argument presented are known as weak arguments. They can be personal or judgmental in nature.

- A weak argument is not directly related to the given statement.
- A weak argument does not discuss the key aspects of the statement.
- It includes limited explanations.
- Weak arguments are personal or judgmental in nature.

Strong Arguments	Weak Arguments
• Present opinions that relate to the central idea being argued.	• Present opinions that are unrelated or vaguely connected to the subject.
• Provide facts, data, information that are relevant and supportive of the subject.	• They are not supported by facts or reason. • They might also present facts or data in relation to a minor/marginal aspect of the argument.

• Are logical and coherent in their construction and presentation	• Are not logical or coherent in their construction.

For example, if you are writing a persuasive note to your mother to try to convince her to give you more pocket money, which of these two arguments do you think will be more effective?

1. If you gave me more pocket money, I will be able to buy more clothes.
2. If you gave me more pocket money, I will be able to purchase more reference books for the upcoming examinations

The second argument is definitely the stronger one as the reasoning used to support it is likely to garner greater support from your mother.



Important Learning:

- An argument that addresses the given issue even by providing a partial solution should be considered a strong argument provided the solution is relevant to the issue and does not create a new set of problems.
- An argument that presents a positive outcome for large number of people is considered a strong argument. For example, even if a government or an organisation's action puts some burden on the public but is justified on the basis that it would improve the quality of the services provided or increase the number of new services, then the argument is strong.
- An argument that presents an unethical, unrealistic or extreme solution is considered weak.

- Any argument that supports added burden on the general population, either in terms of money or hardship, is usually considered a weak argument. For example, if an action is supported on the ground that it would increase the revenue or profitability for an organisation/government but add to the burden of the general public using the service, it is not a strong argument.
- Again, if an action is opposed on the ground that it would increase the expenditure of the government, even if the general public would have gained by the said action, it is considered a weak argument.

Let us elucidate the above points with the help of some examples:

Example

Statement: Should the government invest in female education to improve the sex ratio in the country?

Argument I: Yes. Higher levels of female education will help reduce female infanticide.

Argument II: No. The government does not have the resources to invest in such schemes.

Argument III: No. There is a simple solution to the problem: the boys should be killed.

Solution

In the case discussed above, argument I will be considered a strong argument, because, even though it may not solve the whole problem, it addresses an important aspect of the problem. This is because it presents a positive and relevant solution to the issue being discussed. Argument II will not be considered a strong argument. As mentioned above, in statements involving government/public bodies or people in authority, the cost of undertaking an activity that impacts public life is never a strong argument for not doing it. The third argument, though presenting a direct solution to the core problem of sex ratio imbalance, will be considered weak because it is unethical and extreme. At the same time, it will create larger problems.

Types of questions

Questions with two arguments

Statement: Should the censor board also judge the quality of movies so people do not waste money and time on movies that are boring?

Argument I: Yes. This will encourage producers to make only quality movies.

Argument II: No. People differ in their choice and tastes and it is impossible to ascertain quality of movies.

- (A) If only argument I is strong.
- (B) If only argument II is strong.
- (C) If either argument I or II is strong.
- (D) If neither argument I nor II is strong.
- (E) If both arguments I and II are strong.

Solution

The term *good movies* in argument I is not well defined and is therefore not strong. The second argument describes ascertaining the quality of movies as *impossible* which is not correct and thus the argument is weak. Had the argument used the term *difficult* instead of *impossible*, the argument would have been strong. The best answer is option (D).

The correct answer is D.

Questions with more than two arguments

It is not necessary that you will always get only two arguments in the question to choose from. You may even get four or five arguments with the question stem asking you to identify which of these are strong and which are weak.

Let us take a look at an example:

Statement: Indian students who have completed their education in premium public institutions in India should be barred from taking up jobs abroad as India gains nothing from their expertise.

Argument I: Yes. This is the only way to sustain the high quality of teaching in Indian educational institutions.

Argument II: No. Eventually most of these students come back to India and their experience of working abroad makes them more effective workers.

Argument III: No. Students should be free to decide where they work.

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Only arguments I and II are strong
- (D) Only arguments I and III are strong
- (E) All the arguments are weak

Solution

There is no real connection between the quality of teaching at Indian educational institutions and which country a student chooses to work in. Thus, Argument I is weak.

Argument II gives a strong and logical point against the view given in the statement by showing that the country may benefit in the long run. Thus, Argument II is strong.

Argument III does not address the point raised in the statement that the country gains nothing from the expertise of these students. Thus, Argument III is weak.

The correct answer is B.

Tips for approaching argument-based questions

While attempting Argument questions, make sure you arrive at the answer based only on the information that is given to you in the statement and in the arguments. Do not allow your preconceived notions and biases on the subject matter in the statement come in the way of arriving at the logically correct answer.

Do not use your own presumptions while answering Argument questions. Go only by the facts given to you in the statement.

If the argument relies on some assumption, it is a weak argument. For example:

Statement: Should doctors be banned from carrying out private practice?

Argument: Yes. This will improve the quality of service in public hospitals.

Solution: The above argument relies on the assumption that the cause of the poor quality of service in public hospitals present is the fact that doctors are carrying out private practice. However, this assumption may or may not be true. Thus, this argument is a weak one.

If the argument gives someone's opinion, it is a weak argument. For example:

Statement: Should there be reservation for women in the Parliament?

Argument: No. The home minister does not think so.

Solution: Just because the home minister does not believe something does not mean that it is not the right thing to do. Thus, this argument is a weak one.

A word or phrase should be used to connote the same meaning in the statement and in the argument.

For example:

Statement: Should there be a divorce between the judiciary and the legislature?

Argument I: No. The judiciary and the legislature are not a married couple.

Solution: The word 'divorce' is used in a different sense in the statement, whereas the argument is using the literal meaning of the word. Thus, this argument is a weak one.

Let us now take a look at another example:

Statement: Should people below the age of 18 be allowed to drive a vehicle?

Argument I: No. People below the age of 18 do not have enough mental and physical maturity to drive a vehicle.

Argument II: Yes. People of any age should be free to do what they want.

Solution:

The first argument provides a valid reason why people below the age of 18 should not be allowed to drive. So, it is a strong argument. Argument II on the other hand just provides a random opinion without backing it up with any facts. Thus, it is a weak argument.

The correct answer is A.

6.8 Analytical Puzzles

6.9 What is Measured?

The analytical puzzles section will include linear and circular arrangement questions, data arrangement questions with three or more variables, input-output questions etc., and will test you more on your lateral thinking and visualisation skills.

This section is, to a large extent, testing your ability to make sense of incomplete or abstract text and images.

6.10 Overall Test Taking Strategies

1. While attempting arrangement questions, focus on the overall arrangement and not on individual questions because once you get the arrangement right, the individual questions can be easily answered.
2. Try to represent the given information pictorially or in the form of a Venn diagram.
3. In decision making, make sure you arrive at an objective decision using only the facts given to you in the statement. Do not let your own knowledge or preconceived notions about the subject matter affect your decision making.
4. In symbols-based problems, try to focus on what is within each shape and not just on the shape.

The next few sections will provide you with in-depth strategies for approaching each topic.

Introduction

Analytical Puzzles questions will test you more on your logical and lateral thinking skills. To understand the question better, you need to represent the given information pictorially or in tabular form or in Venn diagram.

Analytical Puzzles will include the following question types.

1 Analytical Puzzles

Arrangement questions will require you to arrange a given set of people or objects in straight lines or in a circular manner. There will be a list of requirements or constraints given to you and you will need to make this arrangement keeping in mind these requirements.

Commonly tested analytical puzzles question types

Linear arrangement questions

Any arrangement which has a well-defined beginning and end is a linear arrangement. It may be of three types:

1. To arrange people or objects in a straight line (row arrangement)
2. To arrange events etc. on basis of time (chronological)
3. To arrange people in other ways (like on basis of age, position, height etc.)

Let us take a look at an example:

Directions for examples 1–4: Read the following information and answer the questions that follow.

Ajay's work requires him to travel to cities C, R, G, J and B (each city for one day and not necessarily in this order) from Monday to Saturday, with a one-day break in the middle.

- (i) He visits G neither on the first nor on the last day but he visits it earlier than R.
- (ii) He visits J the day after he visits R.
- (iii) He visits C immediately before the rest day.
- (iv) J and B had a two day gap between their visits.
- (v) He visited B immediately after the rest day.

Example 1

Which of these is the rest day?

- (A) Monday
- (B) Tuesday
- (C) Wednesday
- (D) Thursday
- (E) Friday

Example 2

Between Monday and Saturday, the visits to J and C have how long a gap between them?

- (A) One day
- (B) Two days
- (C) Three days
- (D) Four days
- (E) Five days

Example 3

On which day does Ajay visit B?

- (A) Monday
- (B) Tuesday
- (C) Wednesday
- (D) Thursday
- (E) Friday

Example 4

Which of the following is a correct statement?

- (A) Ajay visits B on Thursday
- (B) Ajay visits J the day after he visits R
- (C) Ajay visits C and B on consecutive days
- (D) R is the last city that Ajay visits in the week
- (E) The rest day is right in the middle of the week

General Solutions for Examples 1–4:

We first need to decipher the days on which Ajay visits each of the five cities, as after doing so all the questions can be answered easily.

Start by looking at which cities Ajay can visit on Monday.

- G is out as it cannot be the first or the last city Ajay visits.
- Since R has to come before J, J cannot be the first city.
- B cannot be the first city since it comes after the rest day.
- J is out since Ajay visits J after he visits R.
- Thus, C has to be the city that Ajay visits on Monday.

As per the instructions in the question, C has to be followed by a rest day, which is in turn followed by B. So, we get:

Monday—C

Tuesday—Rest day

Wednesday—B

Thursday—?

Friday—?

Saturday—?

Since J and B have a two-day gap between their visits, we get:

Monday—C

Tuesday—Rest day

Wednesday—B

Thursday—?

Friday—?

Saturday—J

Since G has to come before R, the final order we get is:

Monday—C

Tuesday—Rest day

Wednesday—B

Thursday—G

Friday—R

Saturday—J

Using the above arrangement, the questions can now be easily answered.

1. (B)

2. (D)

3. (C)

4. (B)



Important Learning: The first step in Arrangement questions is always to figure out the correct placement of all the entities. The individual questions can be easily answered after that.

Circular arrangement questions

Unlike Linear Arrangement, wherein every position is unique by itself, in Circular Arrangement questions, all the positions are identical. Therefore, in Circular Arrangement questions, the position of an individual depends on the neighbours to the left and right.

Let us now look at an example of a circular arrangement question:

Directions for Examples 5–8: Read the following information and answer the questions that follow.

P, Q, R, S, T, U, V and W are sitting around a circular table.

- (i) P is second to the right of T who is the neighbour of R and V.
- (ii) S is not the neighbour of P.
- (iii) V is the neighbour of U.
- (iv) Q is not between S and W. W is not between U and S. S is not between W and Q.

Example 5

Who is sitting to the right of U?

- (A) P
- (B) U
- (C) R
- (D) V
- (E) Q

Example 6

How many people are sitting between R and Q in a clockwise direction?

- (A) 0
- (B) 1
- (C) 2
- (D) 4
- (E) 5

Example 7

Who is sitting to the left of S?

- (A) P
- (B) Q
- (C) W
- (D) R
- (E) T

Example 8

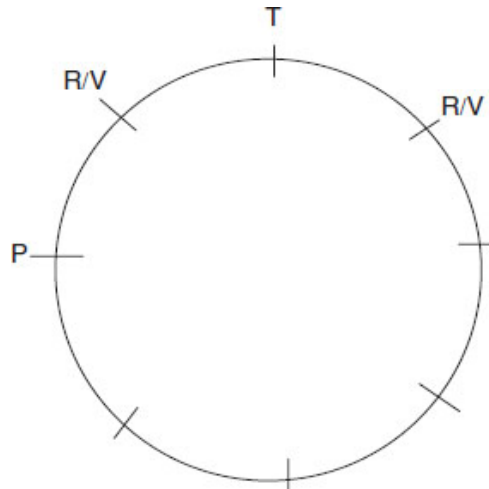
Which of the following is the correct sentence?

- (A) T and S are neighbours
- (B) W and T have exactly three people between them
- (C) T and S have exactly two people between them
- (D) P and S are neighbours
- (E) W and S are not neighbours

General Solutions for Examples 5–8:

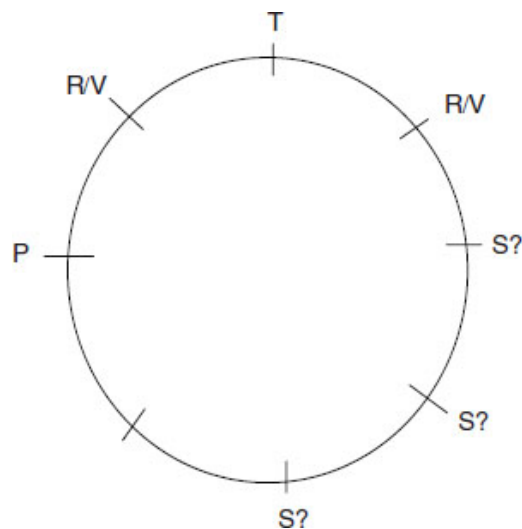
Let us first try to put all the eight people around a circular table based on the given instructions.

Using the information in Statement (i), we get

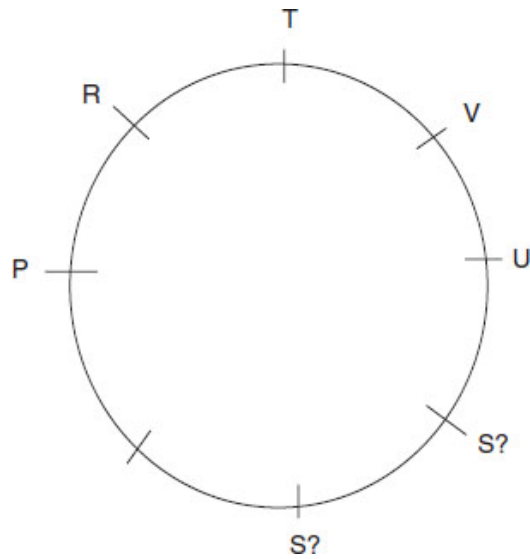


Note: Do not get confused with the lefts and rights. The right of T will be your left because all the people are sitting facing the table.

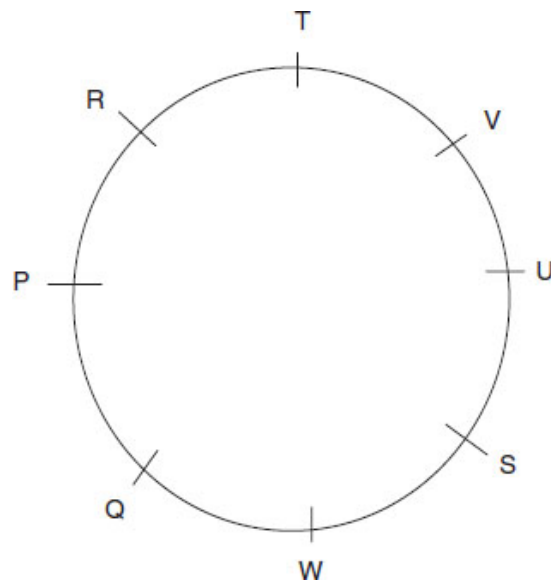
Using the information in Statement (ii) we get



Using the information in Statement (iii) we get



Using the information in Statement (iv), we finally get



Using the above arrangement, we can now easily answer the questions.

5. (D)
6. (E)
7. (C)
8. (B) Note that irrespective of whether you go in the clockwise direction or in the anti-clockwise direction, the answer remains 3. However, the answer changes in the case of

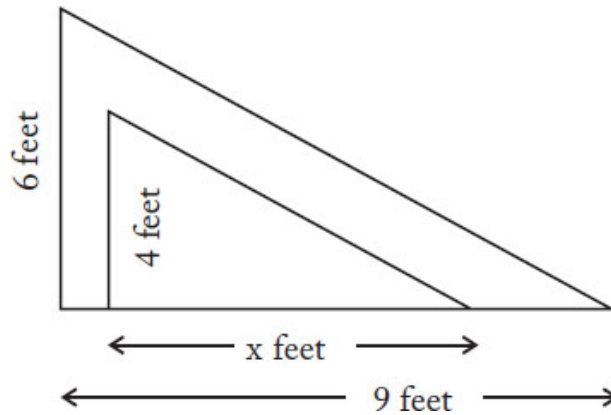
option (C), which is why (C) is incorrect as we do not know which direction to move in.

Mathematical puzzle questions

Example 9

The head of an institution was standing behind a 4 feet high rostrum in an afternoon on a sunny day to address his students. He is 6 feet tall and cast a shadow in his front 9 m long. If he completes his lectures in next 30 seconds and leaves the place, what will be the length of the shadow cast by the rostrum after his departure.

Solution



Given that the shadow of a 6 feet person is 9 feet. The same ratio will be applied by the rostrum while casting its shadow.

$$\text{Therefore, } \frac{6}{9} = \frac{4}{x}$$

So, $x = 6$ feet

Example 10

There is a circular park in a city locality. Rathin walks from any point of the park and goes across the park everyday covering a distance of 200 metres. Now the city authority has decided to widen the park such that the distance covered by him would be 250 metre. What is the increase in the area of the park after the widening of the park?

Solution

Case 1:

Diameter, $d = 200$ m

So, radius, $r = 100$ m

Area, $A = \pi (100)^2 \text{ m}^2$

Case 2:

Diameter, $d = 250$ m

So, radius, $r = 125$ m

Area, $A = \pi (125)^2 \text{ m}^2$

Therefore, increase in the area of the park $= \pi(125)^2 - \pi(100)^2 = 17678.57 \text{ m}^2$

Tips for approaching analytical puzzles questions

1. The trick to solving these questions is to identify the reference point is given in the question (e.g. J in the question we explained above), and use this information to proceed. The information given can then be utilised using this as a reference point.
2. It helps if you can visualise the correct arrangement or pattern in your head. In fact, it is even better if you can draw this pattern on paper to avoid confusion later.
3. Move to the answer choices only after you have read and understood the problem completely.
4. The problem has to be solved only on the basis of the given information. Do not assume any information which does not follow from the instructions in the question.
5. Watch out for words such as *all*, *some*, *none*, *only*, *unless* and so on, since questions will be based on the meaning conveyed by these words.

2 Input-Output Questions

Input-Output is a question type in which you are given a word and number arrangement. With each subsequent operation, the arrangement of the words and numbers changes. These operations are performed until a final arrangement is reached or is performed in a loop. You are required to identify the hidden pattern in the rearrangement and apply it to the questions asked.

Let's take a look at an example

Directions: A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.

Input: *go now 53 39 18 for again 66*

Step 1 : 66 go now 53 39 18 for again

Step 2 : 66 again go now 53 39 18 for

Step 3 : 66 again 53 go now 39 18 for

Step 4 : 66 again 53 for go now 39 18

Step 5 : 66 again 53 for 39 go now 18

Step 6 : 66 again 53 for 39 go now 18

Step 7 : 66 again 53 for 39 go 18 now

As per the rule followed in the above arrangement, attempt the following question.

Input: *chicken wand 24 44 57 Hexa bleach 71*

Example 1

How many steps will be required to complete the rearrangement of the above input?

- (A) Three
- (B) Four
- (C) Five
- (D) Six
- (E) Seven

Solution

The trick to solving Input-Output questions is to first try and identify the structure in the original input-output table given to you. In this question, you will notice that the numbers in the input get arranged in descending order whereas the words get arranged as per their order in the English dictionary. Also note that each step is moving one number or one word such that they alternate with each other, starting with the number. Now, we can apply this same logic to the input given to us in the above question. Here are the steps accordingly:

Step 1 : 71 C W 24 44 57 H B

Step 2 : 71 B C W 24 44 57 H

Step 3 : 71 B 57 C W 24 44 H

Step 4 : 71 B 57 C W 24 44 H

Step 5 : 71 B 57 C 44 W 24 H

Step 6 : 71 B 57 C 44 H W 24

Step 7 : 71 B 57 C 44 H 24 W

Thus the correct answer is 7 steps, that is, Option E.

The correct answer is E.

Tips for Input-Output questions

1. Usually the first, second and final steps of the arrangement are enough to identify the pattern
2. If there are 'n' words/digits in the input then at most ' $n - 1$ ' steps are required to rearrange it completely

6.11 Other Reasoning

6.12 What is Measured?

This section will include ranking test questions, set theory, decision making, syllogisms, Venn diagrams, series, etc., and will test you more on your lateral thinking and visualisation skills.

This section is, to a large extent, testing your ability to make sense of incomplete or abstract text and images.

6.13 Overall Test Taking Strategies

1. While attempting ranking questions, focus on the overall ranking and not on individual questions because once you get the order right, the individual questions can be easily answered.
2. Try to represent the given information pictorially or in the form of a Venn diagram.
3. While attempting direction questions, remember the rules with regards to the direction in which a shadow falls at different times of the day.
4. In symbols-based problems, try to focus on what is within each shape and not just on the shape.

The next few sections will provide you with in-depth strategies for approaching each topic.

1 Missing Value in Figures

These questions will be similar to the series-based questions. Here, a set of numbers or letters are given in different figures such as triangles, rectangles, circles etc. These numbers or letters follow some pattern. You will need to identify this connection in the series of numbers or letters to find the next item in the series.

Some commonly tested series

- (a) Addition series—5, 8, 11, 14, 17, __
- (b) Subtraction series—50, 45, 40, 35, 30, 25, __
- (c) Product series—2, 4, 8, 16, 32, 64, __
- (d) Square series—1, 4, 9, 16, 25, 36, 49, __
- (e) Cube series—1, 8, 27, 64, 125, __
- (f) Fibonacci series—0, 1, 1, 2, 3, 5, 8, __

Tips for approaching questions

1. If the series is increasing gradually, that is, the gap between successive terms is not very large, you are most likely looking at an addition-based series.
2. If the series is increasing rapidly, that is, the gap between successive terms is very large, you are most likely looking at a multiplication-based series.
3. If the gap between successive terms keeps on increasing as you move ahead in the series, you are most likely looking at a series involving squared or cubed numbers.
4. If the series looks very haphazard or random, there may actually be two series within one. For example, the odd integers might be following one pattern and the even integers might be following a different pattern.

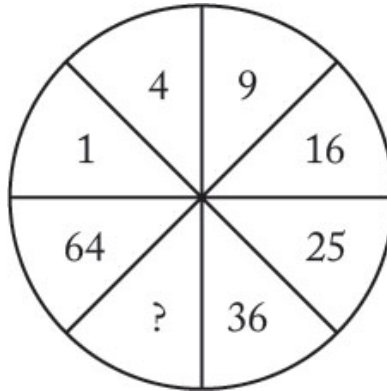


Important Learning: If a series increases gradually, it is most likely addition-based, and if it rises rapidly, it is most likely multiplication-based.

Let us take a look at an example:

Example 1

What number should come in place of the question mark?



- (A) 43
- (B) 49
- (C) 56
- (D) 243
- (E) 343

Solution

The numbers are squares of consecutive numbers— 1^2 , 2^2 , 3^2 , 4^2 and so on.

Thus, $? = 7^2 = 49$

The correct answer is B.

2 Set Theory

Introduction

A set is defined as a group or collection of objects having similar properties. The objects are called elements of the set and are represented by small alphabets while the set itself is represented by capital letters. Also, the number of distinct elements of the set is called the cardinal number of the set.

Representation of a set

There are two basic ways to represent a set:

1. **Tabular or Roster method:** In this method, all the elements of the set are shown or represented within a curly bracket and separated by a comma.

For example, $\{a, e, i, o, u\}$ is the set of all vowels in the English language.

Similarly, $\{1, 3, 5, 7, 9\}$ is the set of all odd natural numbers less than 10.

2. **Set-builder method:** In this method, the elements of the set are not shown. Instead, the rule or criteria to form or build the set are provided.

For example, $B = \{b: b \text{ is a vowel of the English language}\}.$

Types of sets

1. **Empty set or Null set:** A set having zero element or no element is called a null set or empty set or void set represented by $\{\}$ or Φ .
2. **Singleton set:** A set having a single element is called a singleton set.
3. **Universal set:** A set which is the combination of all possible sets under consideration is called the universal set.
4. **Equivalent sets:** Any two sets having the same number of elements, that is, the same cardinal number, are called Equivalent sets.

For example, Set A is the set of all the vowels in the English language while Set B is the set of all the odd numbers less than 10. Then

$$\text{Set A} = \{a, e, i, o, u\}$$

$$\text{Set B} = \{1, 3, 5, 7, 9\}$$

Set A and Set B are called equivalent sets.

5. **Equal sets:** Two sets A and B are said to be equal sets if every element of A is also an element of B and vice versa.

For example, if Set A = {a, c, b} and Set B = {c, b, a}, A and B will be known as equal sets.

Subset of a set

Set A is said to be a subset of Set B if every element of A belongs to B. Also, If A is a subset of B, then B is called the superset of A.

Subsets are of two types, listed as follows:

1. **Proper subset:** If every element of A belongs to B but there is at least one element in B which does not belong to A, then A is called a proper subset of B. This is represented by $A \subset B$.
2. **Improper subset:** If A is a subset of B and A is also equal to B, then A and B are called improper subsets of each other. This is represented by $A \subseteq B$.

Some important properties of subsets:

1. Every set is a subset of itself.
2. Null set is a subset of all sets.
3. Universal set is a superset of all sets.
4. If the cardinal number of a set is n, then the number of subsets = 2^n . Out of these, one subset is an improper subset while the remaining $(2^n - 1)$ subsets are proper subsets.

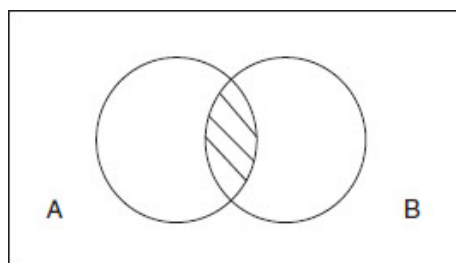
Operations on sets

The following operations have been defined on sets:

1. **Union of sets:** Denoted by $A \cup B$, it is the set of all those elements that belong to Set A or to Set B.

For example, if Set A = {2, 3, 5, 7, 9} and Set B = {1, 3, 5, 6, 8}, then $A \cup B = \{1, 2, 3, 5, 6, 7, 8, 9\}$

2. **Intersection of sets:** Denoted by $A \cap B$, it is the set of all those elements that belong to set A and also to set B.

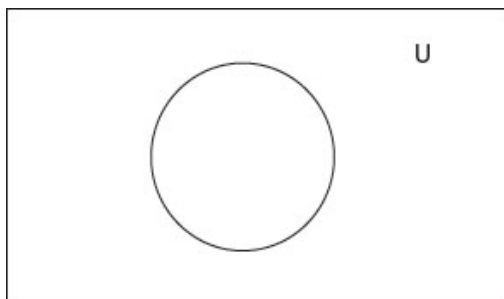


The shaded region in the above figure denotes the intersection of Sets A and B. In the example above, $A \cap B = \{3, 5\}$

If $A \cap B$ is a null set, then A and B are said to be disjoint sets.

3. **Complement of a set:** Denoted by $\sim A$, it is the set of all those elements that belong to the universal set (U) but are not present in set A.

As an example, let Set A be the set of all the single digit natural numbers and let Set B = {2, 3, 5, 7}, then the complement of Set B denoted by $\sim B = \{1, 4, 6, 8, 9\}$



- 4. Difference of two sets:** Denoted by $A - B$, it is the set of all those elements that belong to A but not to B .

Let Set A be defined as $A = \{2, 7, 9, 11, 13, 14, 17, 19\}$ and Set $B = \{2, 5, 8, 11, 12, 15, 17\}$, then, $A - B = \{7, 9, 13, 14, 19\}$ and $B - A = \{5, 8, 12, 15\}$.

Important results on set operations:

1. $n(A \cup B) = n(A) + n(B)$ if A and B are disjoint sets
2. $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
3. $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$

Let us take a look at an example:

Example 1

If set P is the set of all the prime numbers less than 50, find the cardinal number of P .

- (A) 11
- (B) 12
- (C) 13
- (D) 14
- (E) 15

Solution

Prime numbers less than 50 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

The cardinal number of the set P is 15.

The correct answer is E.



Important Learning: If the cardinal number of a set is n , the number of subsets is 2^n . Out of this, $(2^n - 1)$ subsets are proper subsets and the remaining one is an improper subset.

Example 2

In an exam where 175 students appeared, 140 passed in physics, 150 in biology while 10 failed in both the subjects. Find the percentage of people who passed in both the subjects.

- (A) 68.71%
- (B) 71.42%
- (C) 74.56 %
- (D) 78.54%
- (E) 81.76%

Solution

Let x be the number of students who passed in both the subjects.

As 10 students failed in both the subjects, the number of students who passed in at least one of the two subjects = $175 - 10 = 165$. Then

$$140 + 150 - x = 165$$

$$x = 290 - 165 = 125 \text{ students}$$

Percentage of students who passed in both the subjects

$$\frac{125}{175} \times 100 = 71.42\%$$

The correct answer is B.

3 Decision Making

Decision Making is essentially a test of a candidate's ability to apply logical and reasoning abilities to a given issue and arrive at a plausible course of action. The decision-making questions in NMAT by GMAC™ present students with scenarios which need to be resolved effectively. In a nutshell, they are conditions that require a logical and rational decision to be made. These questions involve elements of critical and logical reasoning.

They involve taking steps to address a problem or a circumstance to improve the situation. In such type of questions, a situation is presented within a statement and some actions are suggested in the same context.

These questions are a bit different from conventional reasoning type questions. The main feature of these types of questions is that they are designed in such a way that the decision-making ability of the candidates can be scrutinised. In simple words, these questions test your ability to judge a problem and thus find a suitable course of action for it.

Decision making concepts

Decision making questions challenge a student with respect to his/her eye for detail, ability to adopt a nuanced approach and judgement. To effectively solve and score in this section, you must do the following –

1. Understand the context of the problem
2. Carefully analyse the given information
3. Understand the scope of the problem
4. Choose best possible option

Understand the context of the problem

The first important thing to understand in a question is the context of the problem. In most cases, the problem context can be categorised into one of the following three –

- (A) Context that draws attention to global issues, decision processes of different countries, laws and cultures within nations.
- (B) Context that draws attention to organisational cultures and structure.
- (C) Context that draws attention to a particular employee or decision factor.

Usually, the questions that you will see in NMAT by GMAC™ will not be from context A as this kind of problem solving requires data and information way beyond the scope of an aptitude question. You are most likely to find questions from context B and C. Placing the scenario into a particular context helps define the problem question.

Example 1

Ethan was a team leader for a team of 6 employees at City Infotech. He was popular among employees with a reputation of always delivering results on time. Ethan and his team members usually followed their own office timings and were quite often seen on coffee breaks. The management had ignored these deviations as the team was performing well. Ethan reports in to Julia, who managed 5 team leaders including Ethan. Julia is worried that not addressing these deviations may impact City Infotech's culture negatively in the long run.

Which of the following is the basis of Julia's apprehension?

- (A) The flexibility given to Ethan and his team may be perceived as preferential treatment by others.
- (B) The working style of Ethan's team may affect the working style of other teams
- (C) Ethan and his team's behavior shows a Rohit's blatant disregard for office policies
- (D) Productivity of Ethan's team will go down in the long run.
- (E) Ethan and his teams conduct may affect the other employees negatively.

Who is the problem factor here? Is it Ethan?

Solution

In this question, the management has allowed Ethan the liberty to define the work culture of his team as long as he is delivering results. Julia is worried that this will harm the company. Ethan's behavior speaks of a more liberal work environment than what is probably prevalent at City Infotech. This does not mean that he has disregard for company policies. Also, nothing in the case indicates that his behavior will reduce his team's productivity in the long run. There is also a possibility that his team delivers good results, making Ethan a popular leader, because of his working style.

Julia's apprehension stems from the fact that other employees may start to copy Ethan's behavior. This may lead to disorganisation in the office. Hence, Julia's apprehension is not about Ethan per se but about how culture will be affected in the long run.

Therefore, understanding the context of the problem and identifying the elements to be addressed is extremely important in decision making scenarios.

Carefully analyse the given information

Once a problem has been identified, information is needed about the exact nature of the problem and potential actions that can be taken to rectify it.

Problem solving can be divided into two parts—**process and decision**.

Most of the students, while attempting decision making questions tend to jump straight to the decision. Often, the decisions made are influenced by biases and personal experiences.

While solving these questions it is important that you focus on the process of solving the problem. If we do that, we would realise that in some cases, the information required to reach a decision is missing and the only possible answer to the question can be finding that missing piece of information. This information can be about the priority of solution preferences or about determining the possible impact that the decision might have.

Example 2

Hashim is a brilliant student from a small town in South Africa. He has always been academically bright and went on to obtain an engineering degree from IIT Delhi. As he was finishing his studies, he received two offers from highly coveted companies. Hashim went back to his parents to discuss his future path. Hashim's father runs a small but successful business of exporting gems. He wants Hashim to come home and handle the family business. He tells Hashim that he is getting old and needs Hashim by his side. Also, if Hashim joins the family business, he can earn almost double of what he would make working outside.

What should Hashim do? Should he take up the job offer he has earned with his hard work or should he come back to handle the family business?

Solution

In this scenario, the most important piece of information that is missing is about Hashim's aspirations and goals. The fact that Hashim went on to do an MBA does not necessarily mean that he aspires to a corporate job outside of the family business. Also, Hashim being the only son does not make him the ideal candidate to handle the family business.

Though Hashim's father presents a compelling argument, Hashim may not be able to apply the skills that have been learned by him. Therefore, what Hashim wants is critical in deciding a future course of action. Obtaining this pertinent piece of information is the next crucial step in the decision-making process.

Understand the scope of the problem

Attention must be paid to the scope of the problem. While taking decisions you may have to deal with various aspects of the issue-market analysis, product development, cost-benefit analysis, pricing, compliance with the law of the land and so on. Therefore, one should check the information given against the various aspects to identify the domain in which the problem lies. So, if the issue is related to product development and nothing has been said about compliance, then talking about compliance in any of the answer choices will be out of scope. Let us elucidate this with the help of an example.

Example 3

A leading soap manufacturing company has recently launched a new product that targets the teenage segment. In order to boost its sales, the company has come up with a set of advertisements-both in the electronic and print media. These advertisements have drawn flak from a lot of people for being offensive. There have been lash backs on various social media platforms as well. The CEO of the organisation has called an emergency meeting of the directors to resolve the problem. What should he do?

- (A) Offer his resignation as he is responsible for the product-line and customer satisfaction.
- (B) Fire the head of the legal team as he should have foreseen the legal implications of the new advertisements.
- (C) Recall the product from the market and send it for testing.
- (D) Stop the advertisements with immediate effect and ask the marketing team to work on re-branding the product.
- (E) Do nothing. In today's times, any publicity is good publicity

Solution

In this scenario, it is critical to identify the scope of the problem. *Is it the soap or the advertisement around it that has led to the present crisis?*

Clearly, it is the advertisement campaign that is at the receiving end of the brickbats. Therefore, any answer option that suggests modifications in the product itself will be incorrect. Similarly, maintaining the status quo is also not a desirable course of action. This indicates a passive approach which is not the hallmark of good decision making.

The first two options are also beyond the scope of the problem. Resignation of the CEO or the legal head is not going help in resolving the problem. Also, such decisions are defeatist in nature and bent on identifying scapegoats.

In this scenario, one has to address the primary issue – that of the advertisements. Hence, stopping the campaign and designing a new strategy for marketing the product is the correct course of action to be adopted.

“A Garbage Can Model of Organisational Choice” by Cohen, March and Olsen argues that organisations have four roles or vectors within them: problem knowers, solution providers, resource controllers and decision makers. For effective decision making, all these elements must be in the same room at the same time.

Choose best possible option

Selecting the correct answer involves identifying all the stakeholders in the situation and analyzing the situation from each stakeholder's perspective. The best decision is the one which is pragmatic and addresses the central problem/concern.

Example 4

Rehan is a manager who keeps solving his employees' technical problems. He has been given effective training on key management skills such as delegation and coaching and has the skills to set appropriate boundaries with his or her employees. Yet he continues to spend his time solving technical problems faced by the employees rather than empowering them to figure it out themselves.

Rehan's boss has spoken to him about this a few times and has now called in the human resources manager to help him address the issue. It seems that Rehan is one of those technical managers who seem to want to be back in the technical trenches than lead the team.

What should human resources do? What solution can they propose to this situation?

- (A) Ask Rehan's team members to help by not allowing Rehan to solve their technical problems.
- (B) Work with Rehan and set clear benchmarks to measure his management performance.
- (C) Support Rehan if he wants to be rid of his managerial responsibilities and transfer him to a different department for a subordinate's role.
- (D) Send the team members for a technical training so that Rehan does not have to solve the problems in the future.
- (E) Speak with Rehan and tell him that he can revert to his previous position.

Solution

The first course of action should be to salvage the current situation. Finding a new position for Rehan will not solve this problem. Also, we cannot rely on the subordinates to guide their manager in his role. This eliminates option (A). Option (C) is incorrect as instead of allowing Rehan some more time to better his managerial capabilities, it offers a hasty and piecemeal solution. Option (D) is incorrect as sending the team for training will not help address Rehan's conduct. Option (E) is subtle coercion that will only demotivate Rehan; it is also not a very ethical way to deal with the situation. Thus, the best decision in this scenario is option (B) as it defines the behavior that is expected from Rehan and sets clear benchmarks that will prove helpful to Rehan as well as his superiors.

In a nutshell

1. Make sure you arrive at an objective decision using only the facts given to you in the statement. Do not let your own knowledge or preconceived notions about the subject matter affect your decision making.
2. In such questions, one must opt for the ideal solution. Therefore, if the choice is between practical and ideal, choose ideal.
3. Always employ impartial and objective thinking- our decisions and views should be unbiased and neutral.
4. Make decisions in sync with the way the system and public departments function.

4 Ranking Test

Ranking is the process of determining the position or place of a person or a thing with respect to other persons or things. In ranking questions, relative position or ranking of different group of persons or objects are given and one has to determine position or rank of a person from left to right or from top to bottom of a row or a class or total number of persons is to be calculated. You may also be asked to determine, using data given, which floor which person lives on.



Important Learning: Position can be from either side of the row and rank is always from top or bottom of the row.

Commonly tested ranking question types

Ordering and ranking questions

In ordering and ranking arrangement questions, rank or position of a person from left, right, top or bottom of a row or class is to be determined. Sometimes the positions of two or more persons are given and total number of persons is to be calculated. You also need to determine that which person is living on which floor.

Commonly Tested Ordering and Ranking Question Types

1. If the positions or ranks of a person from both the sides of a row are known, then the total number of persons in the row can be calculated as below:

Total number of persons = Sum of positions of same person from both the sides – 1

Example 1

In a row the position of Salim from the left side of the row is 30th and from the right side of the row is 25th. Find total number of students in the row.

Solution

$$\text{Total number of students} = (30 + 25) - 1 = 55 - 1 = 54$$

- 2.** If the positions of two persons are given from opposite ends and we know the total number of persons, then the number of persons between these two persons can be calculated as below:

Case I: If the sum of positions of the two persons from opposite ends is less than the total number of persons, then the number of persons between these two persons can be calculated as below:

Number of students between two persons

= Total number of students – Sum of positions of two different persons from opposite sides

Example 2

In a row of 65 persons, Radha is sitting 26th from the left end of the row and Krishna is sitting 31st from the right end of the row. Find the number of persons sitting between Radha and Krishna?

Solution

Here Sum of positions of Radha and Krishna from opposite ends = $26 + 31 = 57 < \text{Total number of persons}$

Therefore, number of persons between Radha and Krishna
 $= 65 - (26 + 31) = 65 - 57 = 8$

Case II: If the sum of positions of the two persons from opposite ends is greater than the total number of persons, then the number of persons between these two persons can be calculated as below:

Number of persons between two persons

$= \text{Sum of positions of two different persons from opposite sides} - \text{Total number of students} - 2$

Example 3

In a row of 65 persons, Radha is 31st from the left side of the row and Krishna is 39th from the right side of the row. Find the number of persons sitting between Radha and Krishna?

Solution

Here, sum of positions of Radha and Krishna from opposite ends = $31 + 39 = 70 >$ Total number of persons

Therefore, number of persons between Radha and Krishna = $(31 + 39) - 65 - 2 = 70 - 65 - 2 = 3$

Case III: If positions of different persons from any side are given and total number of students is to be calculated then it is always a case of 'cannot be determined' or 'data inadequate' or 'can't say'. As in this case we do not know if there is overlapping or not.

Example 4

In a row, the position of Radha from the left side of the row is 11th and the position of Krishna from the left side of the row is 35th. Find the total number of students in the row?

Solution

Cannot be determined as position of different persons is given from the same side.

3. In some questions, we need to calculate the minimum number of persons in a row. Such questions are always a case of overlapping, that is, given positions of persons from either sides overlap each other. Then, the minimum number of persons can be calculated as below:

Minimum number of persons = Sum of positions of persons from both sides – Persons between them – 2

Example 5

If position of Puja from the left side of a row is 12th and the position of Sanjeev from the right side of the row is 15th and only 3 persons are sitting in middle of Puja and Sanjeev. Find the minimum number of persons that can be seated in this row?

Solution

$$\text{Total number of persons} = 12 + 15 - 3 - 2 = 22$$

Alphabet test questions

As the name suggests, Alphabet test questions will test you on the English alphabet series. Before we look at the various types of questions you can get in this topic, let's review a few alphabet related concepts.

(i) There are 26 letters – A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(ii) Ranking of letters in the English alphabet series

From left to right

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

From right to left

A	B	C	D	E	F	G	H	I	J	K	L	M
26	25	24	23	22	21	20	19	18	17	16	15	14
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
13	12	11	10	9	8	7	6	5	4	3	2	1

(iii) Opposite of each letter in the English alphabet series

A	B	C	D	E	F	G	H	I	J	K	L	M
↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Z	Y	X	W	V	U	T	S	R	Q	P	O	N

(iv) There are 5 vowels – A E I O U

(v) There are 21 consonants – B C D F G H J K L M N P Q R S T V W X Y Z

(vi) When the question stem says *to the right*, you have to move from left to right, that is, from A to Z

(vii) When the question stem says *to the left*, you have to move from right to left, that is, from Z to A

(viii) When the question stem says *from the right*, you have to move from right to left, that is, from Z to A

- (ix) When the question stem says *from the left*, you have to move from left to right, that is, from A to Z

Commonly Tested Alphabet Test Question Types

One important thing to keep in mind while attempting Alphabet test questions is that these are primarily observation-based questions, that is, most of the time you will not really have to solve anything. You will need to observe the letter arrangement that is given to you and answer questions from this. Let's look at some question types that usually appear in the Alphabet test:

- 1. Position based questions:** These questions will test you on the position of different letters within the English alphabet system or within a letter arrangement that is given in the question stem.

Example 6

Which letter will come exactly between the tenth letter from the left and the seventh letter from the right in the English alphabet series?

- (A) N
- (B) O
- (C) P
- (D) Q
- (E) R

Solution

In the English alphabet series, the 10th letter from the left is J and the 7th letter from the right is T. The letter midway between J and T is O, which is the answer.

The correct answer is C.

- 2. Vowel-Consonant type questions:** In these questions, you will be given an arrangement of letters containing a mix of vowels and consonants. The questions will be based on certain arrangements or patterns of these vowels and consonants.

Example 7

In the letter arrangement given below, how many vowels are preceded by a consonant and followed by a vowel?

D T U H J K I U G N R F E W B K L Z O A N F T G D E R O
P L U J H Y G

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) More than 4

Solution

In such questions, starting from one end of the arrangement (ideally the left end because we read from left to right), look for the vowels. The first vowel you will encounter is U (DTUH....)

Now check whether it satisfies the criteria given in the questions. While U is preceded by a consonant (T), it is not followed by a vowel. Thus, it cannot be part of the answer. Similarly moving right, come to the next vowel – I (K/UG). I is preceded by a consonant (K) and also followed by a vowel (U). Thus, I is part of the answer. Once again, remember not to underline these terms in your book. What you should do instead is write the entire group of three terms (the vowel, the consonant preceding it and the vowel succeeding it) in your rough sheet (KIU) so that, in case you want to double check your work, you don't have to waste time finding the vowels once again in the given arrangement. Keep moving till the end of the arrangement in the same manner. Your final answer set should look like this: KIU ZOA.

Thus, there are two vowels that satisfy the criteria given in the question.

The correct answer is B.

- 3. Make-a-meaningful-word questions:** In these questions, you will be asked to make one or more meaningful word(s) from a given set of letters. These letters could be given to you in isolation or as part of a bigger arrangement.

Example 8

If it is possible to form just one meaningful word using the letters A F E C, the third letter of that word is your answer. If more than one such word can be made, your answer is 'M' and if no such word can be made, your answer is 'X'.

- (A) F
- (B) C
- (C) E
- (D) M
- (E) X

Solution

In such questions, you need to draw upon your knowledge of English words, though the words given to you are usually short, containing only four or five letters. Using the alphabets A F E and C we can actually make two meaningful words – FACE and CAFE. Thus, as per the instructions in the question, the answer has to be M.

Note: *The use of the term ‘meaningful’ in the question stem is very important because the words that you make need to have some meaning. For example, a choice such as FEAC does not work in the above question because it has no meaning.*

The correct answer is D.

- 4. Rule-based questions:** In these questions, you will be given a meaningful English word and you will be asked to base your answer on specific conditions or rules given in the questions.

Example 9

How many such pairs of letters are there in the word BAROMETER each of which has as many letters between them, (in both forward and backward directions) in the word as they have in the English alphabetical series?

- (A) None
- (B) 1
- (C) 2
- (D) 3
- (E) More than 3

Solution

In these questions, you need to check various combinations of letters (with reference to the gap between them) as they appear in the given word as against their positions in the English alphabet series. Let's start from the two most left letters: BA. The gap between them is zero (since they come right next to each other). If you look at the position of BA in the English alphabet series, it is still zero because even in the alphabet series they come together.

Thus, BA is one possible answer so jot it down on your rough sheet. Here note that the order of the two letters (that is which comes first in the given word) does not matter since the question stem clearly says that you can move forward or backward.

Now look for the next combination – BR. In the given word, there is a gap of one letter between B and R whereas in the English alphabet there is a much bigger gap (don't bother calculating this gap because it is obvious that this gap is more than 1 letter). Thus, BR cannot be the answer.

Similarly, now try BO, BM and so on. Once you reach the last combination with B that is BR, you need to start making combinations with A, that is, AR, AO and so on.

Your final answer set will look like this: BA, AROME (gap of 3 letters between A and E, same as in the English alphabet series), TER (gap of 1 letter between T and R, same as in the English alphabet series). Thus, the answer is three.

The correct answer is D.

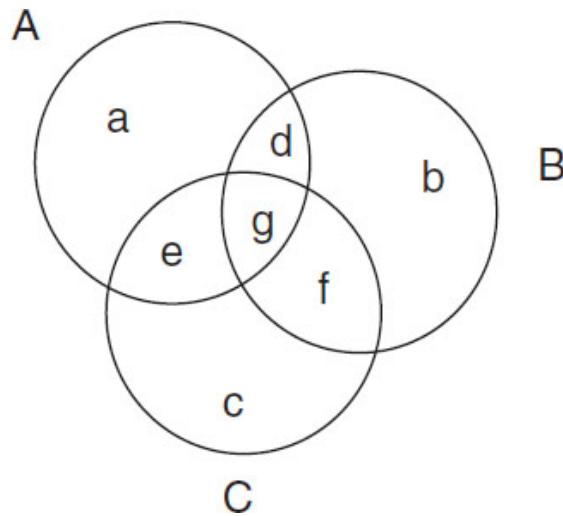
5 Venn Diagrams

The idea of representing a set and solving set-based questions on the basis of a diagram was first suggested by Swiss mathematician Euler and was later developed by British mathematician Venn. So, the diagram representing a set is known as Euler–Venn diagram or simply Venn diagram. A Venn diagram uses a closed curve, generally an oval or a circle, to represent a set.

Important results on set operations:

1. $n(A \cup B) = n(A) + n(B)$ if A and B are disjoint sets
2. $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
3. $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - (B \cap C) - n(A \cap C) + n(A \cap B \cap C)$

Venn diagram for three sets A, B, and C can be represented as below:



Here, the regions a, b, c, d, e, f and g are identified as below:

a = Only A

b = Only B

c = Only C

d = Both A and B but not C

e = Both A and C but not B

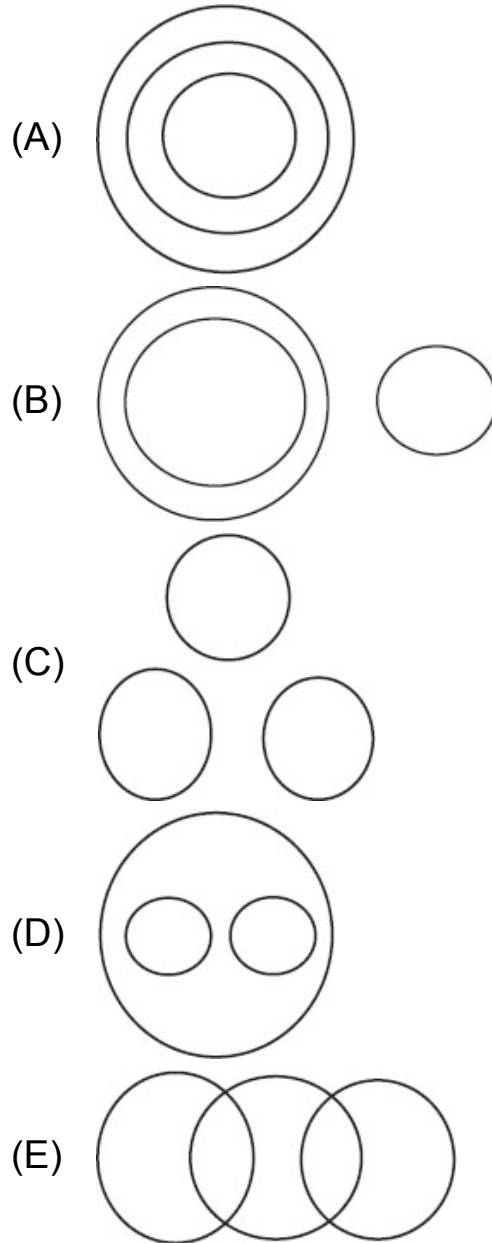
f = Both B and C not A

g = All A, B and C (that is, $A \cap B \cap C$)

Let us take a look at an example:

Example 1

Which of the following diagrams indicates the best relation between tea, coffee and beverages?



Solution

All tea and coffee are beverages but all beverages are not tea and coffee. Option D expresses this relation correctly.

The correct answer is D.

6 Syllogisms

A Syllogism is a logical proposition wherein a conclusion is arrived at using two or more quantified statements. You will typically be asked to determine whether this conclusion can logically be arrived at from the given statements or not. The primary difference between Syllogism questions and, say, Inference questions is that Syllogism questions will always use quantifiable terms such as 'all', 'none' and 'some'.

In Syllogism questions on the NMAT by GMAC™, you will be given two or more statements that will be followed by two or more conclusions.

Your answer choices will be as follows:

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Either conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Let's look at certain concepts of Syllogism before approaching an actual Syllogism question:

1. **Proposition:** Every syllogism question will contain two or more propositions. A proposition is nothing but a statement providing a relation between two terms. For example, *All men are mortals* is a proposition as it provides the relation between the terms *men* and *mortal*.
2. **Use of terms such as Some and All:** Almost every proposition will involve the use of words such as *some*, *all* and *no/none*. If a proposition says *All pens are pencils*, one can conclude that there will not be a single pen that is not a pencil. If a proposition says *Some pens are pencils*, then there could be some pens that are not pencils though it is

not necessary. If a proposition says *No pen is a pencil* then there is not a single pen that is a pencil.

3. **Use of the term *possibility*:** Sometimes, on Syllogism questions, you will come across the term *possibility* in one or more of the given conclusions. Possibility is an interesting term because it may or may not be true. For example, if the two propositions say *Some roses are violets* and *Some violets are jasmine*, then some roses could be jasmine. However, we cannot say this for sure because it is also possible that no rose is jasmine. In such cases, the conclusion *Some roses being jasmine is a possibility* is true because possibility does not mean certainty and there is definitely a possibility that some roses could be jasmine. You will typically see *possibility* being used in the answer choices when one or more of the propositions contain the word *some*.
4. **Answer choices on a Syllogism question:** In a typical Syllogism question, you will be given two statements (propositions), which will be followed by two conclusions. You will need to determine which of these two conclusions logically follows from the given statements. The answer choices will look like this:
 - (A) Only I follows
 - (B) Only II follows
 - (C) Only I and III follow
 - (D) All follow
 - (E) Only III follows

Note that the order of these answer choices might change but the wording of the five options will remain the same. While the remaining answer choices are self-explanatory, answer choice (C) *Only I and III follow* can be confusing at times. Usually, the correct answer will be from one of the other four answer choices. However, there is one situation in which (C) can be correct—*Complementary pairs*. Complementary pairs are two conclusions one of which must be true. For example, the conclusions *Some*

dogs are cats and *No dog is a cat* are a complementary pair because one of the conclusions has to be true—either some dogs will be cats or no dog will be a cat. In such cases, the correct answer will be option (C).

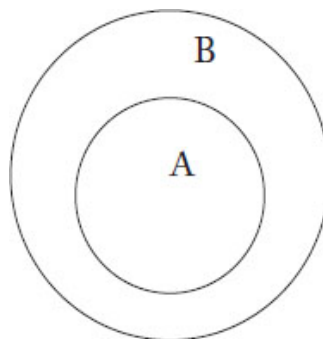
5. Use of Venn diagrams to solve Syllogism questions

You can actually make use of Venn diagrams to answer Syllogism questions because representing the information given in the statements pictorially makes it less confusing.

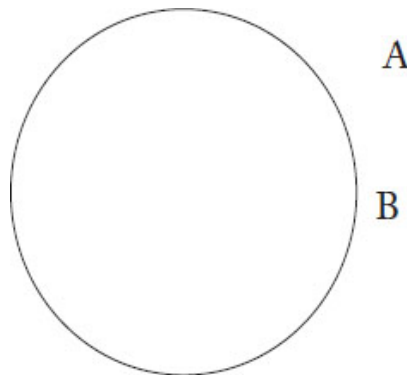
There are four major propositions in Syllogisms that can be represented using Venn diagrams. In all these propositions we will be referring to two entities—A and B—representing each by a circle.

(a) **All A are B** – There are two ways of representing this:

(i) The circle for A is completely within B.



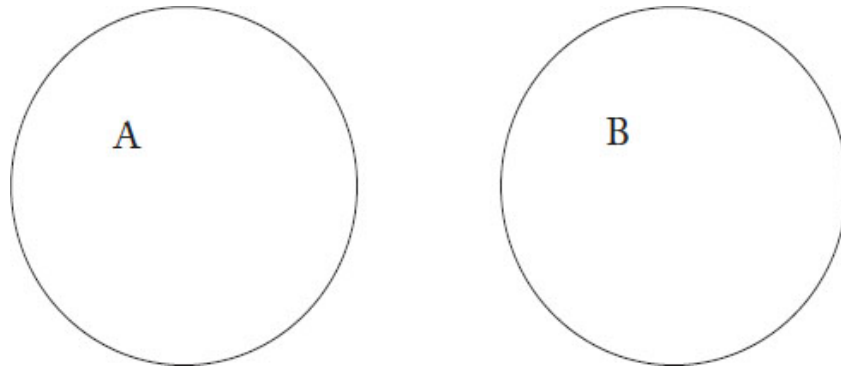
(ii) The circle for A and B is the same, that is, all B are also equal to A.



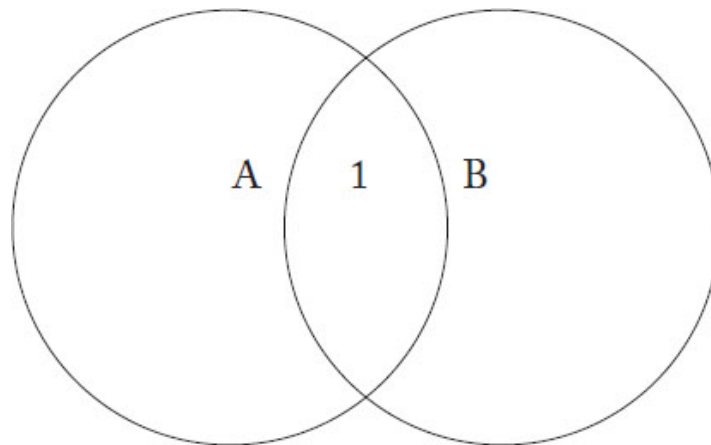
As you can see from the above diagrams, there could be some B that are not A as shown in the first figure. So, *all A*

are B does not necessarily mean that *All B are A*.

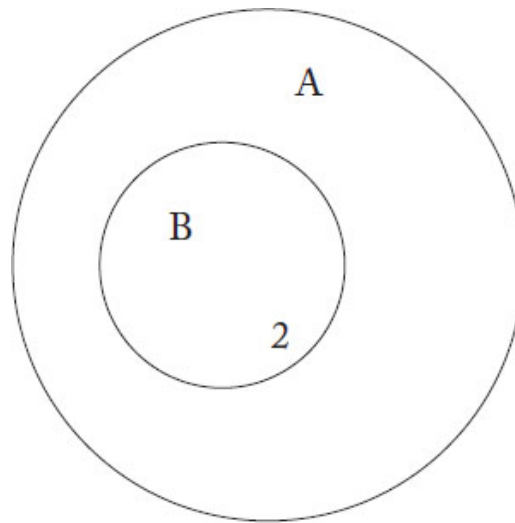
- (b) **No A is B** – This is pretty simple. You simply draw two circles representing A and B with no overlap between them as shown below.



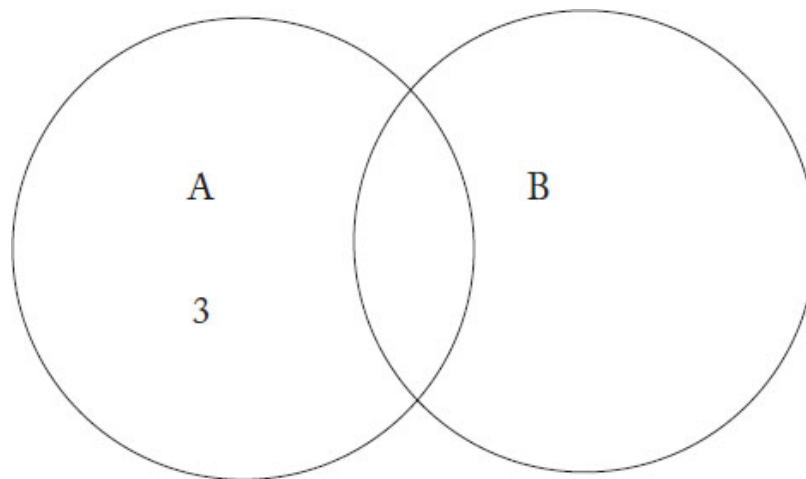
- (c) **Some A are B** – In this case we draw two circles with some intersecting part that represents the A which are also B. In the below figure, Number 1 represents the part where Some A are B.



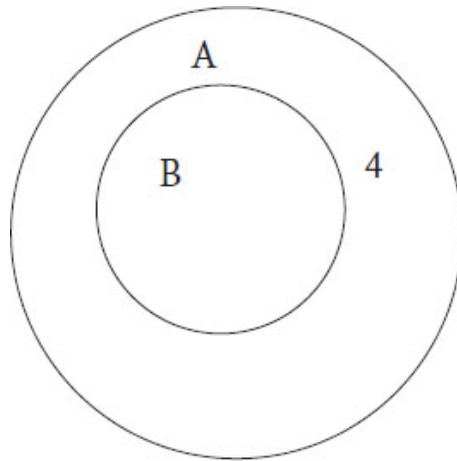
The information can also be represented in the below manner, with Number 2 representing the part where Some A are B.



- (d) ***Some A are not B*** – The Venn diagram for this proposition will look exactly the same as for the previous proposition—*Some A are B*. Just the region representing the proposition changes. In the below figure, Number 3 represents the A that are not B.



The information can also be represented in the below manner, with Number 4 representing the part where Some A are not B.



The above four Venn diagrams give you all possible ways of depicting propositions tested on Syllogism questions. However, note that on an actual Syllogism question, you will have two or more propositions (statements) given to you involving three or more entities. Thus, you will always end up making at least three circles.

Let us take a look at an example:

Example 1

Statement: All dogs are animals. All animals are mortal.

Conclusion All animals are dogs.

I:

Conclusion All dogs are mortal.

II:

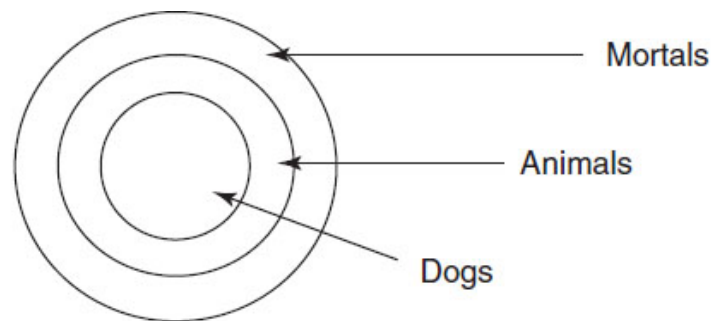
- (A) Only I follows
- (B) Only II follows
- (C) Only I and III follow
- (D) All follow
- (E) Only III follows

Solution

All dogs are animals, but this does not mean that all animals are dogs. There can also be other animals such as cats, horses and so on. Thus, Conclusion I is invalid. Conclusion II, on the other hand, is perfectly valid because if all dogs are animals and all animals are mortals, then all dogs must be mortals.

The correct answer is B.

It may be useful to draw Venn diagrams while answering syllogism questions. For example, in the above question, the answer becomes immediately obvious as soon as you make a Venn diagram, using the information given in the two statements, as shown in the following figure.



Representation of the above question in the form of a Venn diagram



Important Learning: If you come across a confusing syllogism question, try to represent the given information in the form of a Venn diagram and you will easily be able to arrive at the answer.

Let us take a look at another example:

Example 2

Statements All capitalists are rich. No Indians are capitalists

I:

Conclusion No Indians are rich.

I

Conclusion Some capitalists are Indian.

II

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Either conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Solution

The given statements never say that only the capitalists are rich. So, it is possible for Indians to be rich and yet not be capitalists. Thus, Conclusion I is invalid. Conclusion II clearly contradicts the fact given in the second statement. If no Indians are capitalists, then there is no way some capitalists can be Indians. Thus, Conclusion II is also invalid.

The correct answer is D.

You can also be tested on Syllogism questions with more than two statements and more than two conclusions.

Let us take a look at an example:

Example 3

Statements:

- (1) All the wires are cords.
- (2) All the cords are cables.
- (3) Some threads are cables.

Conclusion Some cables are wires.

I

Conclusion Some threads are cords.

II

Conclusion All cords are wires.

III

- (A) Only I and II follow
- (B) Only I follows
- (C) Only II and III follow
- (D) All the conclusions follow
- (E) None of the conclusions follow

Solution

If all wires are cords and all cords are cables, then all wires are cables. So, some cables must be wires. Thus Conclusion I is correct.

All cords are cables does not mean that all cables are cords. Thus, there may be cables that are not cords and it could be these cables that the threads overlap with. So we cannot say for sure that some threads are cords. Thus, Conclusion II is not correct.

Similarly, all wires are cords does not mean that all cords are wires. Thus, Conclusion III is also not correct.

The correct answer is B.

7.0 Logical Reasoning Practice

7.1 Practice Questions

Solve the following questions and indicate the best of the answer choices given.

1 Critical Reasoning

1. A multispeciality clinic was situated in the centre of a small town X, next to a leading software development company. The clinic was attending to and treating numerous patients and was earning a good profit. The software development company, which employed more than 10,000 people was abruptly shut down due to some litigation issues. After a year, the multispeciality clinic also started running into losses and ultimately closed down. The HOD stated that the reason for the losses was the closure of the software company. (**Real NMAT Question**)

Which of the following can be concluded from the passage above?

- (A) All the doctors of the multispeciality clinic left the town once the software company closed down.
 - (B) After the closure of the software company, the multispeciality clinic was the only big employer in the town.
 - (C) The people in the town, even if unemployed, continued to be treated at the multispeciality clinic and were also paying for the treatment.
 - (D) The closure of the software company led to the loss of patients at the multispeciality clinic as most of the diseases originated in the software company.
 - (E) The chief reason for the closure of the multispeciality clinic was the unemployment of the majority of the population in the town as they were not able to afford expensive treatments.
2. The Government has appointed bureaucrats and politicians as heads of various sports institutions. As they do not have the necessary understanding of the sports that is mandatory for the effective functioning of these institutions, they have made some wrong decisions. (**Real NMAT Question**)

Which of the following statements can be concluded from the information given above?

- (A) Bureaucrats can become the heads of sports institutions, but not politicians.
- (B) All bureaucrats and politicians are responsible for the wrong decisions made.
- (C) The Government should replace all bureaucrats and politicians with new faces.
- (D) The heads of different sports institutions should be persons who are involved in the sport.
- (E) The Government is not making the right decisions and should be changed immediately.

3. St. Kilda, a tiny cluster of islands and sea stacks perched in the North Atlantic 40 miles west of North Uist, was occupied for more than 4,000 years. A small community once huddled around the curve of Village Bay on Hirta, the largest island. Sheep grazed steep slopes all around. Modest crops of barley, oats, and potatoes were grown in raised beds, where thin soil was carefully augmented with applications of mineral-rich seaweed. Winter storms, rolling unchecked across thousands of miles of open ocean, struck the islands with almost unimaginable ferocity. In 1852, 36 islanders—roughly a third of the population at that time—chose a long and arduous journey to Australia over remaining on St. Kilda. Many perished at sea.

The most logical conclusion to be drawn from the above paragraph would be:

- (A) St. Kilda is not suitable for human habitation.
- (B) A lot of effort is required to make St. Kilda a habitable place, which is why it is no longer inhabited.
- (C) Even though St. Kilda is not able to support human habitation, people persist in trying to eke out a living there.
- (D) St. Kilda is just barely able to support human habitation, but the challenges involved may be too much for some of its inhabitants.
- (E) The 36 islanders who undertook the arduous journey to Australia were unsuccessful in their attempts.

4. According to the observations, the self-motivated lot set their own targets and were content with their own achievements, whether or not their contributions were externally acknowledged by their supervisors or colleagues. On the other hand, there was the shirker lot, who always looked at ways to shirk their work, whatever be the external motivation. For the most part though, the workers' contributions were in direct proportion to external motivation. **(Real NMAT Question)**

Which of the following can be best concluded from the above statements?

- (A) One should try and keep the shirkers away from the motivated lot.
 - (B) Every organisation would gain by having more of the motivated lot.
 - (C) Organisations should identify the various kinds of workers working with them.
 - (D) The majority of the workers in an organisation work for rewards and compensation.
 - (E) Identify the shirkers to try and immediately eliminate them from the system, lest they corrupt the others
5. Over the last few years e-mail services have become very good at spotting spam. It catches just about every junk message before it hits the inbox; the messages are rerouted to the spam folder, which I myself almost never open (and when I do open it, I never notice legitimate messages marked as spam). In other words, spam—which was once the great boogeyman of the Internet, a scourge that was often predicted to bring down e-mail entirely—is no longer a problem. We have won the War on Spam.

Which of the following, if true, would significantly strengthen the conclusion in this paragraph?

- (A) A number of e-mail services have promised to get better at catching spam in the near future.
- (B) While spam is no longer a problem, the number of e-mails—even legitimate ones—that people get keeps increasing constantly.

- (C) Statistics show that the amount of spam being sent is also going down, as the senders realise that their messages are never read.
- (D) The senders of spam keep coming up with a variety of tricks to bypass spam filters, but so far, the spam filters have kept up with those tricks.
- (E) Yahoo users receive a lot of spam every year.

6. Scientists have discovered that manganese containing Element Z is stronger and more flexible than ordinary manganese because Element Z reduces the problem of small breakages. The level of Element Z in much of the manganese produced in Australia is naturally high because of the natural topography of the region.

Which of the following can be correctly inferred from the statements above?

- (A) Manganese produced from Australian ore deposits contains the highest levels of Element Z found in any manganese.
 - (B) Manganese from Australia is stronger and more flexible than manganese from any other country.
 - (C) Manganese that is not from Australia is very likely to encounter the problem of small breakages.
 - (D) Producing manganese from ore deposits containing Element Z is the best way to make manganese that is strong.
 - (E) Some manganese produced in Australia is less likely to develop small breakages than other manganese.
7. A company sells two types of mobile phones – A and B. The total sales of these two phones increased by 24% between 2010 and 2015. In the same period, however, the sales of ‘B’ type mobile phones, most of which were sold from the company’s exclusive outlets, grew by just 6%.

Which of the following conclusions about the company’s sales from 2010–15 is best supported by the statements above?

- (A) Buyers were more likely to buy type ‘A’ mobile phones when they went to multi brand phone sellers.

- (B) The prices of mobile phones purchased at the company's exclusive stores were higher than those phones that were purchased elsewhere.
- (C) The sales of type 'A' mobile phones increased by more than 24% during this period.
- (D) A majority of Type 'B' mobile phones were purchased by corporate buyers who tend to make bulk purchases.
- (E) The number of people who bought mobile phones from multi-brand sellers increased during this period.

8. Who wouldn't enjoy a comedy film?! (**Real NMAT Question**)

What are the assumptions implicit in the above exclamation?

- (A) Everyone watches movies.
- (B) Comedies are worth being enjoyed by everyone.
- (C) There are at least some people who enjoy comedies.
- (D) Nobody watches movies of a genre other than comedy.
- (E) Comedies are the only genre on which movies are made.

9. "Why were you curbing his freedom? Be dignified."

Which of the following is implied in the above? (**Real NMAT Question**)

- (A) Dignity and freedom may co-exist at will.
- (B) Someone was curbing somebody's freedom.
- (C) Dignity and freedom are completely disparate events.
- (D) It's impossible to retain dignity without stepping on someone's freedom.
- (E) It's possible to retain one's self-respect without encroaching on someone else's freedom.

10. A group of researchers in Boston, Massachusetts have developed a dietary supplement that triggers the body to increase the levels of free testosterone naturally and safely.

Which of the following can be most inferred from the statement above? **(Real NMAT Question)**

- (A) Testosterone in the body can only be increased through dietary supplements.
- (B) Testosterone in the body could not be increased before this epochal research result.
- (C) Testosterone when provided as a dietary supplement, does not attach itself with anything and is found to be free.
- (D) Increasing testosterone in the body used to be possible before this research attempt too, however, they were perhaps unsafe and artificially induced.
- (E) There are two types of testosterone in the body - bonded that attaches to molecules and are mostly ineffective and free testosterone that can easily enter cells and increases strength and stamina.

11. In the National Park, the white tigers hardly moved around, they always looked for opportunities to lie around. **(Real NMAT Question)**

From which of the following can the above statement be most properly inferred?

- (A) White tigers are usually known to be lazy.
- (B) The National Park makes the tigers active.
- (C) Only white tigers are known to hunt their food aggressively.
- (D) If an active tiger is seen at the National Park, it must not be the white tiger.
- (E) Due to their appearance, white tigers attract a lot of attention, which in turn makes them aggressive.

12. A new technology in laser printing is set to improve the quality of images considerably for the same cost. However, a survey revealed that a lot of companies did not plan to switch over to the new technology in the immediate future. **(Real NMAT Question)**

Which of the following is implied in the above statement?

- (A) Some companies think that the new technology might not be successful.

- (B) The quality of the images is not the only thing that the companies look for when deciding on printing solutions.
- (C) The images produced by the new technology require a longer time to dry and this can become a deterrent to its adoption.
- (D) The companies had to consider the cost of switching from existing technology to a new one and that cost was considerable.
- (E) The people handling the purchase decisions are not aware of technological developments and hence take erroneous decisions.

- 13.** Use of credit has both advantages and disadvantages. While one can buy goods through credit option, many consumers may buy things they do not really require or can even afford. But it also allows them to take advantage of bargains when they are short of cash. Anyone who takes advantage of this latter possibility saves money by buying on credit.

Which of the following is an assumption made in the passage above?

- (A) Anyone who wants can buy goods through credit option at no extra cost for which there is no point in using such a facility.
 - (B) It is difficult for anyone to show restraint while buying goods through the credit option. However, these goods are usually available on a bargain as well.
 - (C) The cost of credit does not exceed the saving on purchases that credit makes possible.
 - (D) All purchases made on credit are unnecessary purchases for which using such a facility is a waste of money.
 - (E) A buyer who buys goods through the credit option will make use of this facility to even buy goods which have absolutely no utility for him or her.
- 14.** Economists have discovered that, at comparable income levels, people living in rural areas generally have more purchasing power than people living in cities. This is because some of the income that

city dwellers use for food and housing can be used by rural dwellers for other needs.

Which of the following assertions is implied the most in the above statements?

- (A) People in both rural and urban areas tend to spend a large proportion of their income on food and housing.
- (B) The actual income of city dwellers is more as compared to rural dwellers.
- (C) People living in rural areas have lower food and housing costs than people living in cities.
- (D) While city dwellers earn more, they also spend more because of higher food and housing costs.
- (E) City dwellers save a larger proportion of their income than rural dwellers.

15. “If you are an MBA aspirant, and hence are preparing for various entrance exams, you should study Thorman Lewis to enhance your vocabulary” – an advertisement.

Which of the following assumptions is not implicit in the above statement? (**Real NMAT Question**)

- (A) MBA aspirants generally prepare for entrance exams.
- (B) Thorman Lewis is a book meant only for MBA aspirants.
- (C) If asked for, Thorman Lewis is available for the readers.
- (D) For an MBA aspirant it is important to have enhanced vocabulary.
- (E) There are some people who would want to prepare for MBA and will read this advertisement.

16. As part of the austerity measures, the Government has put a ban on foreign travel unless approved by an official of the Secretary level. (**Real NMAT Question**)

The argument above assumes that:

- (A) many officials make unnecessary foreign visits.
- (B) even essential foreign visits could be discouraged.

- (C) only Secretaries can approve foreign travel of officials.
- (D) the Government wants to cut down on avoidable expenditure, which includes travel that can be avoided.
- (E) due to an economic crunch, the Government is first trying to curb avoidable foreign visits before looking to implement other measures.

17. **Statement:** A very reputed non-banking finance company has launched a loan scheme for buying new agricultural tools. The farmers have responded well to the scheme and it has become successful as it has brought prosperity among the farmers.

Which of the following assumptions is implicit in the above statements?

- (A) The prosperity of farmers is the only measure of the success of a loan scheme.
- (B) Only tools are important for farmers to enhance farm activities.
- (C) Earlier there was no such loan scheme available for farmers.
- (D) Farmers do not prefer taking loans for buying agricultural tools on their own.
- (E) The prosperity of farmers is an important indicator for the success of a loan scheme.

18. **Statement:** According to a recent survey, innumerable diseases ranging from cancer to AIDS, among others, have plagued mankind due to unhealthy habits.

Which of the following, if true, may be the most plausible cause for the spread of the above mentioned diseases?

- (A) The lifestyle and food habits of people, if not healthy, cause many diseases.
- (B) People themselves are responsible for the environment they live in.
- (C) People are aware of factors that can contribute to lifestyle related diseases.
- (D) Fast pace technological advancement is rampant these days contributing to the spread of diseases.

- (E) Cancer and AIDS are not avoidable by changing lifestyle and food habits.

19. Man has reached Mars but is still unable to feed everyone on Earth.
(Real NMAT Question)

Which of the following is implied in the above statement?

- (A) Food is scarce on Earth.
(B) Mars is a good source of food.
(C) Man went to Mars to explore agricultural possibilities.
(D) Advancements in space, science and agriculture are not at par with each other.
(E) Despite immense advancement in science, the basic need of all people on Earth is unfulfilled.

20. I think that evil begets stupidity. An organisation that wins by exercising power starts to lose the ability to win by doing better work. And it's not fun for a smart person to work in a place where the best ideas aren't the ones that win, and so evil organisations start losing their smartest employees. I think the reason Google embraced the motto 'Don't be evil' so eagerly was not so much to impress the outside world as to inoculate themselves against arrogance.

Which of the following is a basic assumption made in this argument?

- (A) Google is not an evil organisation.
(B) An organisation that abuses its power is an evil one.
(C) Smart employees prefer not to work in evil organisations.
(D) Stupid employees do not mind working in evil organisations.
(E) Adopting mottos helps an organisation avoid being evil.

21. As Peter Parker's Uncle Ben says to him: 'With great power comes great responsibility.' **(Real NMAT Question)**

The argument above assumes that:

- (A) Uncle Ben is always right.
(B) At least some people follow Uncle Ben.

- (C) Peter Parker has got some great powers.
- (D) Peter Parker listens to what his uncle says.
- (E) Uncle Ben sometimes lends his words of wisdom to Peter Parker.

- 22.** The Black Spider Monkey of Brazil has become endangered because of human activities such as, deforestation and logging, which causes destruction of the monkey's natural habitat. (**Real NMAT Question**)

Which of the following if true would weaken the above argument?

- (A) Costa Rican government is constantly trying to preserve the natural habitat of the squirrel monkeys in order to save them from extinction.
- (B) A certain allele (alternate gene) discovered in a black spider monkey pointed to micro-evolutionary extinction setting in.
- (C) Habitat loss in the Congo basin has seen no remarkable change in the count of Dryas monkeys in this region.
- (D) Habitat loss in the Congo basin has seen a decrease in the count of Dryas monkeys in this region.
- (E) WWF-funded protected areas have seen a slight revival in the number of the black spider monkey.

- 23.** To increase aircraft occupancy, it is necessary to stop offering food on the airplane so that the prices of tickets can be reduced without reducing the per ticket profit.

Which of the following, if true, will support/strengthen the claim made in the argument above?

- (A) The price of food served on the airplane is almost equal to the price of food in cities.
- (B) Most passengers like to eat to pass their time during flight hours.
- (C) Flight journeys are generally short and it is not inconvenient to avoid eating during the journey.
- (D) Ticket price is not the only issue for people who do not prefer air travel.

(E) Most passengers regard in-flight food as an integral part of the travel experience.

- 24.** With an active mass media people have now become aware of their rights and are willing to fight for them.

Which of the following, if true, will support/strengthen the claim made in the argument above?

- (A) According to recent data collated by the Consumer forum there is a 150% rise in complaints against poor services.
- (B) Most discussions in mass media are celebrity-centric.
- (C) People got to know about the existence of the Citizen charter for each department only through the websites of those departments.
- (D) Both (A) and (C)
- (E) People have always been very aware of their civil rights.

- 25.** To reduce losses of the fuel marketing companies, the government has decided to deregulate the diesel and petrol prices.

Which of the following, if true, will support/strengthen the claim made in the argument above?

- (A) If prices of petrol and diesel are increased, the demand for them will fall sharply.
- (B) Fuel consumption patterns rarely show any changes in the amount consumed with fluctuation in price.
- (C) Automobile sales have dipped rapidly.
- (D) Farmers use diesel to run machines for agriculture.
- (E) The government has decided to invest in oil refineries.

- 26.** Annual recruitment in public sector banks has increased in the recent years. This will lead to scarcity of talented candidates for private banks.

Which of the following, if true, will support/strengthen the claim made in the argument above?

- (A) As compared to public sector banks, private banks pay higher salaries.
- (B) There is a limited number of people who have the specialised skill set required for banking jobs.
- (C) Many people do not consider jobs in public sector banks challenging.
- (D) The services of an employee of Public Sector banks cannot be terminated.
- (E) Many people apply for private sector bank jobs.

27. I have no doubt that the Government of India should make Hindi the official language of the country. How can we justify that the government spends so much money to print documents in different languages because of those who cannot read and/or write Hindi. The government should spend tax payers' money for better causes. The Government of India should enable people to learn Hindi at the earliest.

Which of the following, if true, would weaken the speaker's argument the most?

- (A) The government translates official documents into more than eighteen languages to reach people who cannot read or write Hindi.
- (B) Hindi is already the most spoken language in India.
- (C) People who do not know Hindi also pay taxes to the Government of India.
- (D) Many people who travel across the country do learn Hindi within a year.
- (E) Hindi is already the official language of India and other languages are equally important for the country.

28. Most often Scientific journals published in Commonwealth countries refer to articles written in English only. However, there are many interesting scientific developments reported in other languages. So because of a basic linguistic ignorance on the part of scientists in these countries, articles written in other languages do not get

referred. This inevitably results in a failure to benefit from scientific progress made in other non-english speaking areas.

Which of the following, if true, tends to confirm the conclusion given above?

- (A) The linguistic ignorance of a scientist in these countries is an indication of a more general indifference towards foreign languages among the scientific community.
- (B) Many scientific findings reported in scientific journals published in these countries inadvertently repeat studies done in non-english speaking countries.
- (C) All important scientific findings are translated and also published in english-language journals making them available to the scientists of these countries.
- (D) Reporting a scientific progress is a universal phenomenon and is never limited to any single language of a single country.
- (E) Reporting of scientific development is a process that is compulsorily to be published in journals in different languages.

29. 'When women stop reading, the novel will be dead,' declared Ian McEwan in the **Guardian** last year. He reached this rather dire conclusion after venturing into a nearby park in an attempt to give away free novels. The result? Only one 'sensitive male soul' took up his offer, while every woman he approached was 'eager and grateful' to do the same. Unscientific as McEwan's experiment may be, its thesis is borne out by a number of surveys conducted in Britain, the United States and Canada, where men account for a paltry 20 percent of the market for fiction. Unlike the gods of the literary establishment who remain predominantly male—both as writers and critics—their humble readers are overwhelmingly female.

Which of the following most weakens the argument made in this paragraph?

- (A) The people in one park are not a good representative of the entire readership of novels.
- (B) The number of men reading novels may be fewer than the number of women, but men read more novels per capita.

- (C) Men read a variety of books, including plenty of non-fiction, while women read more fiction than non-fiction.
- (D) The male readership of novels is significantly higher than the female readership in places other than Britain, the United States and Canada.
- (E) Men like reading books—the world has always had more male writers than female writers.

30. To anthropologists of the future, the gym boom of the past few decades may look more like a sinister cult than a fitness movement. Gym-going, after all, has all the basic lineaments of a religion. Its adherents are motivated by feelings of guilt, and the urge to atone for fleshly sins. Many visit their places of worship with a fanatical regularity: a third of LA Fitness members, for instance, go virtually every day. Once there, believers are led by sacerdotal instructors, who either goad them into mass ecstasy during aerobics classes, or preside over the confessional tête-à-tête of personal training. Each devotee has his own rituals, though most rely on the principles of self-mortification and delayed gratification.

Assuming the following are true, which of them casts most doubt on the argument in this paragraph?

- (A) Not all people turn gym-going into a ritual, or even go regularly.
- (B) Unlike the workings of a cult, those of a gym are above-board and meant to help people, not brainwash them.
- (C) People go to the gym for many reasons, including socializing or just feeling good about themselves, and not for any fanatical reasons.
- (D) There is at least a genuine scientific basis for going to the gym—i.e. getting more exercise and becoming fitter and healthier—unlike joining a cult.
- (E) Cults promote fanatical devotion and commitment, not unlike gyms.

31. Hosting a high-profile sporting event like the Olympic Games or the World Cup can generate significant intangible benefits for the host city or region, whose residents are likely to derive appreciable pride and sense of community from hosting the event. Their homes are the

focus of the world's attention for a brief but intense period. The planning and work required to host the event take significant time and effort—much of which is done by volunteers—and engender a considerable local and national sense of accomplishment. These factors are both important and valuable, even though researchers find it difficult to place a dollar value on them.

Which of the following, if true, does NOT weaken the argument made in this paragraph?

- (A) Research shows that cities in which such events are hosted have fewer instances of communal or societal tensions as compared to cities that have never hosted such events.
- (B) The sense of community and accomplishment last only as long as the event itself lasts, which may be just a few days, and have no long-term effects.
- (C) The kind of attention garnered by the host city or region may be more negative than positive, i.e. the rest of the world may feel itself licenced to criticise the local politics and culture.
- (D) There are several cheaper ways in which a sense of community and camaraderie can be promoted.
- (E) People already have a sense of community by virtue of living in a particular place for a long time.

- 32.** Evolutionary behaviourists are trying to understand why it is that the emotional connection between siblings can last a lifetime. The prevailing theory is that it all comes down to maths. With our nearest relatives—each parent, our full-siblings, and our children, we share 50 percent of our novel genes. This overlap helps explain the continual cycle of family love. The shared 50 percent is the basis for our instinctive willingness to make all sorts of investments and sacrifices—even perhaps the ultimate sacrifice—for those with whom we are closest. On the level of the gene, it's a good idea to ensure those most like us will spread part of our uniqueness. It's a banal truism that what we feel towards our closest relatives is generally different from our feelings for people with whom we don't share this connection. But why? The researchers say that the emotions of love and fidelity are nature's way of doing the maths on behalf of our genes.

Which of the following facts, if true, would strengthen the argument in this paragraph?

- (A) Research shows that identical twins, who share 100 percent of their genes, are emotionally closer to each other than fraternal twins, who share only 50 percent of their genes.
- (B) Research shows that identical twins, who share 100 percent of their genes, are much more alike than fraternal twins, who share only 50 percent of their genes.
- (C) Research shows that half-siblings, who share only 25 percent of their genes, are not as alike as full-siblings, who share 50 percent of their genes.
- (D) Research shows that half-siblings, who share only 25 percent of their genes, are just as emotionally close as full-siblings, who share 50 percent of their genes.
- (E) Research shows that full-siblings, who share 50 percent of their genes are just as emotionally close as identical twins, who share 100 percent of their genes.

- 33.** Ensuring equal opportunity has long been a prominent goal in many countries, particularly Western Europe and America. These countries have more equality of income - what a person gets for his efforts and the yield of his property after taxes are deducted. Many economists in India believe this concept of equality should be implemented in developing countries in order to speed up economic development.

Which of the following, if true, will bring out the flaw in the argument above?

- (A) In developing countries, equality of opportunity ensures equality of income but a person doesn't get paid for his efforts.
- (B) The excess income in the hands of people with higher incomes provides less utility than extra income in the hands of those with lower incomes.
- (C) High achievement in many societies is due to equality of incomes that comes from the fact that equality of opportunity ensures equality of income.
- (D) In developing countries, gross income of most of the people is so low that if it were distributed equally, no one would save

enough to provide resources for investment.

- (E) In developing countries, gross income of most of the people is very low because of rampant corruption and high illiteracy.

- 34.** A popular talk show host has been regularly making fun of a new movie on his programme for the past few days. The director of the movie attributes the poor performance of the movie to this fact.

Which of the following options most seriously weakens the above argument?

- (A) Several other film makers have also accused the talk show host of talking poorly about their movies.
- (B) There has been no change in the ticket prices at movie theatres in the past few months.
- (C) The talk show host has also made fun of several other movies and TV programmes on his talk show during this period.
- (D) The talk show host makes fun of only those movies that perform poorly at the box office.
- (E) The movie has been criticised by some sections of the media too for being overly long and having a clichéd storyline.

- 35.** In a recently conducted survey on the quality of life among the citizens of a city, surveyors spoke to 980 citizens, a majority of whom said that they were satisfied with their quality of life. Thus, it can be concluded that the citizens of this city are satisfied with their quality of life.

Which of the following options most seriously weakens the above argument?

- (A) The surveyors spoke to people from only a particular economic strata.
- (B) Some of the respondents said that they were extremely dissatisfied with their quality of life.
- (C) The survey results are different from what have been reported from other neighbouring cities.
- (D) The survey sample was representative of the entire population of the city.

(E) The governing body of the city is not very different from the governing bodies of other neighbouring cities.

- 36.** There are two ways of successfully completing a marathon—practise running for 4 hours every day or make changes to your diet so that you are consuming more high energy foods. Research has clearly proved that practising running is far more effective than making changes to your diet, as far as competing in a marathon is concerned. Thus, if a person consistently runs for at least 4 hours every day, he is doing the most that can be done to perform well in the marathon.

Which of the following options, if true, most seriously weakens the above argument?

- (A) Some experienced marathon runners believe that diet plays a more important role in their performance than exercise or running.
 - (B) The performance in the marathon can be improved further by employing both the strategies together.
 - (C) Everyone who competes in a marathon does not necessarily do so for the purpose of winning it, but for its health benefits.
 - (D) One of the most important aspects of performing well in a marathon is the ability to manage your pace.
 - (E) A marathon is as much a test of endurance as it is of speed.
- 37.** Kavita is going to appear for an aptitude test in two months. To successfully clear this test, a person needs to do two things—take 20 practice tests and also attend 15 coaching sessions by a popular teacher. Nobody who has failed to meet the previous two criteria has ever cleared this test. If Kavita takes the 15 coaching sessions, she will only have enough time to attempt 15 practice tests and if she attempts 20 practice tests, she will only have enough time to take 10 coaching sessions.

The claims above, if true, most strongly support which of the following conclusions?

- (A) Kavita should take all 15 coaching sessions and then take as many tests as she can since tutoring is more important than

practising.

- (B) As long as Kavita takes the 20 practice tests, she will most likely be able to clear the aptitude test.
- (C) Kavita will retake the aptitude test if she is not able to successfully clear it the first time.
- (D) Kavita will most likely not be able to clear the aptitude test.
- (E) If Kavita attends the 15 coaching sessions, she will most likely be able to clear the aptitude test.

- 38.** Conservation of tigers is a major concern for wildlife experts across the world since the number of tigers left in the wild is rapidly declining. While several countries are taking steps to counter this fall, experts are unanimously of the opinion that if the tiger is to survive in the wild, its best chances of doing so are in India.

The claims above, if true, most strongly support which of the following conclusions?

- (A) The survival of the tiger is under threat in countries other than India also.
- (B) If the tiger fails to survive in India, it will become extinct.
- (C) The Indian government is not taking enough steps to check the poaching of tigers.
- (D) The maximum number of tigers in the world are found in India.
- (E) The number of tigers outside India is falling at a faster rate than within India.

- 39.** Over the past 2 years, there has been a sharp decline in the number of smokers in college campuses across the city. Over this same period, the city's governing council has spent a lot of money in coming up with advertisements highlighting the harmful effects of smoking targeted at college students. The authorities conclude that its advertisements have been responsible for the drop in cigarette use at college campuses within the city.

Which of the following options most seriously weakens the above argument?

- (A) There has been no similar decrease in the consumption of alcohol among college students.
- (B) There has been no appreciable decrease in the number of smokers within the city who are not in college.
- (C) The supply of cigarettes has remained unchanged within the city.
- (D) A change in the taxation structure has led to a rapid increase in cigarette prices over the last two years within the city.
- (E) Some studies show that there is no direct relation between smoking and the susceptibility to diseases such as lung cancer.

- 40.** The sale of badminton racquets in Chennai has tripled in the last year. Thus, it can be concluded that more and more people in Chennai have started playing badminton.

Which of the following options most strengthens the above argument?

- (A) Chennai is famous for its badminton racquets and tourists often buy these racquets when they visit Chennai.
- (B) The sales of badminton racquets in other cities have not shown a similar increase.
- (C) The majority of the badminton racquets sold in Chennai were sold to residents of Chennai.
- (D) The sales of cricket bats and golf clubs have also shown an increasing trend in Chennai.
- (E) Badminton racquets are a popular gift item when residents of Chennai visit their relatives in other cities.

- 41.** In the last one month, more than a dozen children have been attacked by Rottweilers (a large dog breed) when they stepped out of their house to play. Thus, it is unsafe to keep dogs as pets in neighbourhoods with a large population of children.

Which of the following options most strengthens the above argument?

- (A) Rottweilers have also occasionally attacked adults accompanying the children and even other dogs.

- (B) The Rottweiler is known to be a particularly ferocious dog breed that can attack at the slightest of provocations.
- (C) Small dog breeds like the Pug are very friendly towards children and can be safely kept in neighbourhoods with a large population of children.
- (D) Children need to be taught not to tease dogs or run when a dog comes towards them.
- (E) The behaviour exhibited by Rottweilers towards children is representative of the behaviour of all dogs in general.

- 42.** Petroleum and its by-products such as petrol and diesel cause a lot of pollution and increase our carbon footprint. Over the last few years, petrol and diesel have been replacing other non-renewable fuels thereby polluting the atmosphere and as a result, affecting health. The condition is particularly bad in cities like Delhi and Mumbai.

(Real NMAT Question)

Which of the following weakens the argument?

- (A) Petrol causes less pollution as compared to diesel.
 - (B) Petrol and diesel have been replacing fuels like coal, which are even more dangerous.
 - (C) Petrol and diesel virtually run our economy. Without these fuels, we would be back in prehistoric ages.
 - (D) The use of solar energy has severe limitations and hence cannot replace non-renewable fuels like petrol.
 - (E) Indian companies are adopting new technologies to reduce pollution and selling carbon credits in the international market.
- 43.** India has decided to step up exports of various consumer goods to China.

Which of the following statements strengthens India's decision?

(Real NMAT Question)

- (A) China is the third largest market in the world for these consumer goods.

- (B) The process of getting approval for trade in China is tedious and takes a long time.
- (C) China is known for manufacturing these products at comparatively economical prices.
- (D) The tax paid to the Chinese government on the total turnover in China has increased by 8%.
- (E) Market barriers and cost competitiveness restrict the entry and growth of companies in China.

- 44.** The University has increased the pace of work for getting the NAAC accreditation, which is a must to attract students from all over the country. It has decided to get the accreditation in the next six months. All the requirements for getting A+ grading must be fulfilled. **(Real NMAT Question)**

Which of the following statements weakens the decision of the University?

- (A) A committee has been set up to prepare the Self Study Report of the University in 2 months.
- (B) The required infrastructure will be built up by the contractor in the next 2 years in a phased manner.
- (C) The University Academic Council has done a detailed study of the requirements for NAAC accreditation.
- (D) The Board of Management will review the Self Study Report after 2 months for necessary corrective actions.
- (E) The recruitment of the required minimum number of faculty members will also be done before the inspection of the NAAC team.

- 45.** There should be special tax rebates for small scale enterprises as these enterprises create numerous jobs for thousands of people. It is also suggested that company laws should be flexible up to a certain limit for the small scale industries.

Which of the following, if true, most severely weakens the argument?
(Real NMAT Question)

- (A) Company laws can be easily changed for the sectors that create jobs.
- (B) Tax rebates and flexibility of laws will encourage people to engage in only small scale enterprises.
- (C) All the small scale enterprises together generate huge revenues and so tax rebates should be there for them.
- (D) Most small scale industries, over time, become big enterprises even without any form of rebates or government support.
- (E) Some small scale industries are usually subsidiaries of giant ventures so tax rebate and flexible laws are not a viable option.

46. Statement: Rebellion is known as the disobedience to a lawful authority that is caused due to widespread discontent among certain groups of people. When a government wants to tackle such a situation, it should maintain calm and continue to urge the rebels to hold talks with the authority in order to find a solution together. Therefore, the government of the day should be mindful, tolerant, and open to peaceful negotiation.

Which of the following, if true, could weaken the argument above?

- (A) When a government shows lack of understanding of its own people, it causes discontentment among its population that results in defiance of its authority.
 - (B) People in some part of any country are, by nature, rebellious and hence cannot be made to follow discipline.
 - (C) Government of any country, by nature, tends to be authoritative and may not like to be challenged whatever maybe its nature or method of governance.
 - (D) It is found that dictators with an iron hand approach have dealt with rebellion successfully.
 - (E) When a government shows care for its own people, it causes contentment among its population and no talk is required for solving any problem.
- 47.** It is sometimes mooted that there can be democracy in a two party system. That would be correct if politics were a game like cricket or football; but politics is not sport.

Which of the following would strengthen the argument?

- (A) Two party system is practiced in the maximum number of democracies in the world.
- (B) Politics is a dirty game.
- (C) Two political parties limit the choice of the voters.
- (D) Sports, just like politics needs to be fair.
- (E) A two party system is a waste of time and energy.

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- (E) A two party system is a waste of time and energy.

49. Children are often heard saying that they do not want to drink milk as they cannot digest it. (**Real NMAT Question**)

Which of the following arguments strengthens the above statement?

- (A) Children are known to come up with dumb excuses.
- (B) In adults, the ability to digest milk is a genetic adaptation.
- (C) Milk intake is good as it increases the calcium levels in the body.
- (D) Children who avoid milk face an increased risk of pre-pubertal bone fracture.
- (E) It has been scientifically proven that there are lactose-intolerant people who cannot digest milk.

50. While China's north-south gradient did retard crop diffusion to some extent, it was less of a barrier there than in the Americas or Africa.

China's long east-west rivers (the Yellow River in the north, the Yangtze River in the south) facilitated diffusion of crops and technology between the coast and inland, while its broad east-west expanse and relatively gentle terrain, which eventually permitted those two river systems to be joined by canals, facilitated north-south exchanges. All these geographic factors contributed to the early cultural and political unification of China, whereas western Europe, with a similar area but a more rugged terrain and no such unifying rivers, has resisted cultural and political unification to this day.

Which of the following, if true, would weaken the main argument in this passage?

- (A) Western Europe is mostly industrial and urban, while China is more agrarian and rural.
- (B) The Americas and Africa are no more politically or culturally united than western Europe is.
- (C) Geography is not as important a factor for cultural and political unification, as similarity in languages and lifestyles are.
- (D) Western Europe is made up of many different countries and cultures, while China is a single country with a more homogenous culture.
- (E) Of late, there have been indicators of cultural and political unification in Western European countries as well.

2 Deductions

Directions for Questions 1–6: For each of the following questions there is one argument followed by two statements. Check whether the statements are valid inferences drawn from the argument. Give your answer.

- (A) If only Inference I can be inferred from the argument.
- (B) If only Inference II can be inferred from the argument.
- (C) If either Inference I or Inference II can be inferred from the argument.
- (D) If neither Inference I nor Inference II can be inferred from the argument.
- (E) If both Inferences I and II can be inferred from the argument.

1. **Argument:** The East coast of the country is prone to natural disasters in the form of thunderstorms and cyclones, which occur for a couple of weeks during the hot season. For most part of the year, the weather is dry and winds are mild along that coast.

Inferences:

- I. Hot season lasts for only two weeks on the East coast of the country.
- II. For most part of the year the east coast is safe from disasters.

2. **Argument:** A number of research studies report that the correlation between incomes and residence in slums is nowhere near perfect. People living in slums may actually be well above the conventional standards of poverty as measured by urban poverty lines.

Inferences:

- I. Some people live in slums despite being able to afford a house elsewhere.
- II. Poverty lines do not measure incomes accurately.

3. **Argument:** The deforestation activities in the Amazon have generated tremendous revenue for the small South American nations. Now the people of this region are well-fed, owing much to the state-sponsored food security programmes.

Inferences:

- I. People of the South American nations are not self-reliant in buying food.
- II. The small nations in the South American region invest a part of their revenues on food security.

4. **Argument:** Gold prices have dropped in the recent months due to a fall in demand for gold bars. This is contrary to the normal trend seen during the festive season where demand for gold ornaments is higher that results in an increased demand for gold bars.

Inferences:

- I. The general belief is that gold prices rise during the festive season.
- II. Demand for gold bars is not connected with the demand for gold ornaments.

5. **Argument:** Programme on television that are targeted at women usually revolve around recipes and hints on household management. The print media also follows suite.

Inferences:

- I. Women are interested only in such matters.
- II. Women are not interested in sports.

6. **Argument:** In a cricket league match held in South Africa a team scored 198 runs of which 100 runs were made by all-rounders.

Inferences:

- I. More than half of the team consists of all-rounders.
- II. Most of the all-rounders were spinners.

7. **Statement:**

Aluminium manufactured in India is of a much better quality than the aluminium manufactured in other countries across the world.

Conclusion I: Indian aluminium manufacturers make huge profits on the sale of their aluminium.

Conclusion II: The manufacturing process employed by aluminium manufacturers in India contributes to its better quality.

- (A) Only I can be inferred.
- (B) Only II can be inferred.
- (C) Either I or II can be inferred
- (D) Neither I nor II can be inferred
- (E) Both I and II can be inferred

Directions for Questions 8–12: For each of the following questions there is one argument followed by two statements. Check whether the statements are assumptions made in the argument to arrive at the conclusion made. Give your answer.

- (A) If only Assumption I is implicit in the argument
- (B) If only Assumption II is implicit in the argument
- (C) If either Assumption I or Assumption II is implicit in the argument
- (D) If neither Assumption I nor Assumption II is implicit in the argument
- (E) If both Assumptions I and II are implicit in the argument

8. **Argument:** Ravi Sharma's new book is refreshingly different. It is based on the emotions that the youth faces in today's metros as they grow up. This book will definitely be his first best-seller.

Assumptions:

- I. All books based on the emotions of the youth will be best-sellers.
- II. Ravi Sharma did not have a best-seller till date.

9. **Argument:** Niloufer has received the Employee of the Year award at the Macrosoft Annual Convention. She has also clocked the most

number of hours at work compared to all other colleagues.

Assumptions:

- I. 'Employee of the Year' is usually awarded to employees who work longer hours.
- II. Niloufer is quite friendly with her bosses.

- 10. Argument:** Madhu cleaned her room in two days whereas Sapna, who is her elder sister, cleaned her room in three days. It is evident that Madhu cleans rooms quicker than Sapna does.

Assumptions:

- I. Madhu's and Sapna's rooms are of the same size.
- II. Sapna loves to clean whereas Madhu loves to play games.

- 11. Argument:** Meena has taught in more than ten schools in the past fifteen years. With her diverse experience in teaching, she should prove to be a very good teaching resource for your new school.

Assumptions:

- I. Meena is extremely qualified for the job.
- II. Teaching in many schools for many years makes one a very good teaching resource.

- 12. Argument:** The weather department has forecast an early monsoon this year. Advisories have been issued from all local stations to farmers for hastening the harvest of horticulture crops and preparing the land for sowing of grain crops.

Assumptions:

- I. The weather department's forecast is accurate.
- II. Farmers cannot take any decisions without the help of the weather department.

Directions for Questions 13–19: In each question below is given a statement followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. You have

to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Give answer if

- (A) Only assumption I is implicit,
- (B) Only assumption II is implicit,
- (C) Either assumption I or II is implicit,
- (D) Neither assumption I nor II is implicit,
- (E) Both assumptions I and II are implicit.

- 13. Statement:** Rahul's new car ran off the road causing some damage to the front part of the car. He is claiming insurance on the repairs needed. His insurance premium will shoot up.

Assumptions:

- I. Insurance premium shoots up if you claim insurance on the damage of a new car.
- II. Insurance premium shoots up if you claim insurance for damage to the front part of a car.

- 14. Statement:** The 'Everybody Party' has come up with a new sop in its election agenda. It is promising to increase the upper limit of LPG cylinders' ration per family, from 12 to 14 per year. This sop is expected to give the party a clear edge over other parties in garnering the middle-class votes.

Assumptions:

- I. The new sop is not promised by any other party.
- II. Middle-class voters will benefit from the raised ration limit of LPG cylinders.

- 15. Statement:** The new mobile phone model of 'Same Song'- Milky Way KD4, is lighter, larger and faster than the previous models. In the first week of its release, the company sold a record 1.3 million sets across the world. This model will be the highest selling model in the sales history of the company.

Assumptions:

- I. No other model of 'Same Song' has sold 1.3 million pieces in the first week.
- II. All customers prefer lighter, larger and faster models of mobile phones.

16. Statement: Of late, incidents of food poisoning caused by the consumption of grains mixed with impurities have been taking place in rural areas.

Assumptions:

- I. There are shops selling grains mixed with impurities in rural areas.
- II. The percentage of people consuming grains is higher in rural areas.

17. Statement: Children less than five years of age need to be continually kept mentally stimulated.

Assumptions:

- I. A large part of the development of intelligence and other social skills takes place in the early years of a child.
- II. 40 percent of a person's intelligence at the age of 22 can be predicted by the age of five.

18. Statement: The Apogee Laptop Company has decided to increase the price of its laptops by 25 percent with immediate effect.

Assumptions:

- I. Other laptop manufacturers will also soon raise the prices of their respective laptops since Apogee is the market leader.
- II. The Apogee Company does not expect the demand for its laptops to go down considerably after this hike.

19. Statement: Suresh has applied for a loan of Rs. 60000 from his bank to pay for his son's educational expenses.

Assumptions:

- I. The bank will reject the loan because it has a policy of not awarding loans for education purpose.

II. Suresh has failed to arrange for the money from all other sources available to him.

- 20. Statements:** A very large number of aspiring students applied for admission to the professional courses run by a renowned college in town. (*Real NMAT Question*)

Assumptions:

- I. All applicants may be able to get admission to the college.
II. The admission process adopted by the renowned college may be fair to all applicants.

- (A) Only Assumption I is implicit.
(B) Only Assumption II is implicit.
(C) Either Assumption I or II is implicit.
(D) Neither Assumption I nor II is implicit.
(E) Both Assumptions I and II are implicit.

- 21. Statement:** People need to find better ways to live life wisely. (*Real NMAT Question*)

Assumptions:

- I. People don't live life wisely.
II. People have ways to live life wisely.

- (A) Only Assumption I is implicit.
(B) Only Assumption II is implicit.
(C) Both assumptions I and II are implicit.
(D) Either assumption I or II is implicit.
(E) Neither assumption I nor II is implicit.

Directions for Questions 22–31: In the following questions a fact situation is given followed by two suggested courses. A course of action is a step of administrative decision taken for improvement or follow-up action. Read the situation and then decide which of the given courses of action follows.

Give answer,

- (A) If only course of action I follows
- (B) If only course of action II follows
- (C) If either I or II follows
- (D) If neither course of action follows
- (E) If both courses of action follow

- 22. Statement:** In the wake of the recent spate of vector borne diseases such as Dengue and Malaria, the state government has decided to declare these as notifiable diseases under the existing Epidemics Act. According to this Act, the family members of the patient are bound to inform the state authorities and are liable to be punished in case they do not do so.

Courses of Action:

- I. The efficacy of the government's decision depends on effective implementation of the Act. Hence, efforts should be made to implement it in letter and spirit.
- II. The government should propagate the instances of punishment through mass media to make people aware of the stern action taken against the defaulters.

- 23. Statement:** This year conjunctivitis seems to be a major epidemic witnessed after nearly four years even though there have been sporadic cases of conjunctivitis every year around the monsoons.

Courses of Action:

- I. Precautionary initiatives should be taken every four years to check this epidemic.
- II. People should be cautioned not to visit their neighbours during the rainy season.

- 24. Statement:** The bank manager of a city branch had a foreboding that some money might have been missing from the safe of the bank.

Courses of Action:

- I. He should get the safe checked with the help of the staff and if required take help of the CA handling the bank's account.
- II. He should lodge an FIR with the police and get the culprit arrested as soon as possible.

25. Statement: A popular news channel is concerned about the quality of its programmes, particularly in light of losing business to its competition.

Courses of Action:

- I. It should plan to revise its fee structure for the artists and take various other measures to attract talent for its programmes.
- II. It should take stringent action against people involved in the programmes which lost their popularity and led to a loss in business.

26. Statement: The enteric fever, a water-borne disease, has turned out to be a killer this year. So far it has claimed more than 500 lives across the country. In rural areas of Bihar the toll has been over 100 during the past two weeks.

Courses of Action:

- I. The residents of these villages should immediately stop using drinking water from open sources such as ponds and canals.
- II. The Government should immediately send a medical team to this area to restrict spread of the killer disease.

27. Statement: The companies producing fuel in India have been found lacking in both quality and quantity of their supplies to bulk consumers, especially the thermal power stations. This has resulted not only in low volume of power production but also in increased cost of production especially to the thermal power stations.

Courses of Action:

- I. The Government should slap legally enforceable penalties on the fuel producing companies defaulting on the quality and quantity of supplies.

- II. The Government should force the fuel producing companies to introduce welfare measures for their employees so that they don't show laxity.

28. Statement: Every year, at the beginning or at the end of the monsoons, we have some cases of conjunctivitis, but this year, it seems to be a major epidemic, witnessed after nearly four years.

Courses of Action:

- I. Precautionary measures should be taken after every four years to check this epidemic.
- II. People should be advised to drink boiled water during rainy season.

29. Statement: The Korean garment export industry venturing into the Latin American markets faces tough competition from the Chinese.

Courses of Action:

- I. Garment manufacturers from Korea should drop the plans of entering Latin America.
- II. Garment manufacturers from Korea should improve the quality of their products so that they are able to compete better with the Chinese.

30. Statement: The influx of apples imported from California in Indian stores has considerably reduced the demand for indigenous apples, which tend to be of an inferior quality.

Courses of Action:

- I. The government should force Indian stores to stop selling the imported apples and incentivise them to sell Indian apples.
- II. To help indigenous apple growers, the government should impose high import duties on imported apples.

31. Statement: The state owned airline has been continuously making losses for the past several years with no signs of profits anytime soon.

Courses of Action:

- I. The government should provide a bailout package to the airline in order to ensure that it does not collapse.
- II. The government should take steps to ensure that the airline improves its productivity and reduces wasteful expenditure.

Directions: Given alongside is a statement followed by a few suggested courses of action. For the given situation, select the best course of action that follows.

- 32. Statement:** There is quiet unrest among people today—it will be no surprise if this simmering discontent turns into some kind of violent protest. (*Real NMAT Question*)

Courses of Action:

- I. The government needs to be sharp and realise the mood of its people—it should take steps to address the existing pain points and not allow anything to snowball.
- II. The government should carry on with its work as usual—unrest in people is obvious when things become difficult.
- III. The government needs to focus on the economy—everything else will fall into place.

- (A) Only I should be pursued.
- (B) Only II should be pursued.
- (C) Only III should be pursued.
- (D) Both II and III should be pursued.
- (E) None should be pursued.

- 33. Directions:** A statement is followed by three courses of action numbered I, II and III. A course of action is a step or administrative decision to be taken for improvement, follow-up or further action in regard to the problem, policy etc. On the basis of the information given in the statement, decide which of the suggested courses of action should logically be pursued. (*Real NMAT Question*)

Statement:

In the last 3 months, at least 12 restaurants in the area have caught fire due to the lack of various safety measures. With slow emergency response times, these incidents have resulted in the death of around 100 people.

Courses of Action:

- I. The government should make fire insurance mandatory for all restaurants.
- II. The government should check the wiring of buildings in the area.
- III. The Fire Brigade should be made to arrive more promptly.

- (A) Only I follows.
- (B) Only II follows.
- (C) Both I and II follow.
- (D) All follow.
- (E) None follow.

- 34.** In the following questions a fact situation is given followed by two suggested courses. A course of action is a step of administrative decision taken for improvement or follow-up action. Read the situation and then decide which of the given courses of action follows.

Give answer,

- (A) If only course of action I follows
- (B) If only course of action II follows
- (C) If either I or II follows
- (D) If neither course of action follows
- (E) If both courses of action follow

Statement:

Zenith Cotton, India's largest cotton exporter, is incurring huge losses due to an increase in the number of competitors in the market.

Course of Action:

- I. The company should offer attractive discounts on all its products to attract customers.
- II. Zenith Cotton should analyse its competition-their products and methods and then take necessary action.

Directions: Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be concluded to be a fact.

35. Facts:

Fact 1: The products available at malls are generally of a better quality.

Fact 2: Most of the products available at malls are expensive.

Fact 3: The number of people going to malls has gone up tenfold in the last two years.

Statements:

- I. Products available at malls may not be expensive.
- II. There are no cheap products available at malls.
- III. People don't mind paying more for better quality products.

- (A) Only I can be concluded.
- (B) Only II can be concluded.
- (C) Only III can be concluded.
- (D) Both I and III can be concluded.
- (E) None of the statements can be concluded.

- 36. Directions:** Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be concluded to be a fact. (*Real NMAT Question*)

Facts:

Fact 1: ABC public school has 300 students.

Fact 2: At least 1/3rd of them have chosen horse riding as a hobby.

Fact 3: At least 1/6th of them have chosen art as a hobby.

Fact 4: Almost half of them have chosen creative writing as a hobby.

Fact 5: Students are allowed to choose more than one hobby only if they wish to do so.

Statements:

- I. At least one student chooses two activities.
 - II. The majority of the students at ABC choose creative writing.
 - III. There are 3 hobbies offered at the school - horse riding, art and creative writing.
- (A) Only I can be concluded.
 - (B) Only II can be concluded.
 - (C) Only III can be concluded.
 - (D) Both I and III can be concluded.
 - (E) None of the statements can be concluded.

37. Facts:

Fact 1: A is B's sister.

Fact 2: A's son is C.

Fact 3: C's aunt is B.

Statements:

- I. A has no brother.
 - II. B's nephew is C.
 - III. B is unmarried.
- (A) Only I can be concluded to be a fact.
 - (B) Only II can be concluded to be a fact.
 - (C) Both I and III can be concluded to be facts.
 - (D) Both II and III can be concluded to be facts.
 - (E) None of the statements can be concluded to be a fact. (**Real NMAT Question**)

Directions for Questions 38–39: Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a ‘strong’ argument and which is a ‘weak’ argument.

Give answer:

- (A) If only argument I is strong
- (B) If only argument II is strong
- (C) If either I or II is strong
- (D) If neither I nor II is strong and
- (E) If both I and II are strong.

38. Statement: Should Drinking be prohibited?

Arguments:

- I. Yes. It is wrong to drink away one’s money.
- II. No. Thousands of workers in the wine industry will be rendered unemployed.

39. Statement: Should teaching of Tamil be made compulsory at school level in Tamil Nadu?

Arguments:

- I. No, where are the trained teachers to teach this language?
- II. Yes, Tamil Nadu’s people should be proud of their ancient language.

Directions: Given alongside is a statement followed by three arguments numbered I, II and III. Decide which of the given arguments is strong and is able to support the given statement.

40. Statement: Should CBSE continue with the new grading system which is based upon the teacher’s informal evaluation of pupils rather than pupil examination? (*Real NMAT Question*)

Arguments:

- I. Yes. Informal evaluation reduces the pressure felt by students.

- II. No. The pressure of examinations prepares pupils for the pressures they will face in later life.
- III. No. Exams improve a student's manners and etiquettes.
- (A) Only I is strong.
- (B) Only II is strong.
- (C) Only III is strong.
- (D) Both I and II are strong.
- (E) Neither of them are strong.

Directions for Questions 41–42: consist of a statement followed by two arguments numbered I and II. Decide which of the Arguments is strong. Select from the following options.

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

- 41. Statement:** Should all the illegal construction that has been carried out in the city by unscrupulous builders be demolished?

Arguments:

- I. Yes. This will dissuade such builders from carrying out such activities in future and also punish people for buying such properties.
- II. No. There are people living in these buildings who will have nowhere to go.

- 42. Statement:** Has the easy availability of consumer loans made life easier for the Indian consumer?

Arguments:

- I. Yes. The consumers can now buy items that they couldn't afford earlier.

- II. No. The easy availability of these loans can make consumers buy unnecessary things.

Directions for Questions 43–45: Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a ‘strong’ argument and which is a ‘weak’ argument. Select from the following options:

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

43. Statement: Should more new universities be set up in India?

Arguments:

- I. No, the government will have to spend a lot of money in setting up new universities.
- II. Yes, setting up more universities will boost foreign interest in the country’s education system.

44. Statement: Should the government shut down all loss-making public-sector enterprises?

Arguments:

- I. No. This will result in a loss of employment for hundreds of people.
- II. Yes. The government should minimise its loss and spend the amount on creating alternative employment opportunities

45. Statement: Smoking is injurious to health. (*Real NMAT Question*)

Argument:

- I. Many smokers are known to have died of heart and lung diseases.
- II. More smokers die of cancer than non-smokers.

III. Smoking causes lung cancer.

- (A) Only Argument I is strong.
- (B) Only Argument II is strong.
- (C) Only Argument III is strong.
- (D) Only Arguments II and III are strong.
- (E) All of the arguments are strong.

3 Analytical Puzzles

Directions for Questions 1–4: Read the below information and answer the questions that follow.

Six people: C, D, E, F, G and H are standing in a straight line facing North, not necessarily in the same order. F is standing second to the left of D. C is standing fourth to the left of H and H is not standing on the extreme end of the line. D is standing second to the left of E.

1. What is the position of F with respect to E?
 - (A) Immediate left
 - (B) Fourth to the left
 - (C) Third to the left
 - (D) Third to the right
 - (E) None of these
2. Which of the following pairs represents the people standing at the extreme ends of the line?
 - (A) CE
 - (B) FH
 - (C) FE
 - (D) CH
 - (E) None of these
3. Who is standing second to the right of F?
 - (A) H
 - (B) D
 - (C) G
 - (D) E
 - (E) None of these

4. Four of the following five pairs are alike in a certain way based on their position in the above arrangement and so form a group. Which of the following pairs do not belong to the group?
- (A) GC
 - (B) GE
 - (C) HG
 - (D) DE
 - (E) FD

Directions for Questions 5–8: Read the below information and answer the questions that follow.

Eight friends N, L, M, R, P, Y, T and Q are sitting around a circular desk facing away from the centre. Each friend has a different car—Lambretta, VW, Lycan, Creta, Ariel, Garmin, Punto and Scorpio, but not necessarily in that order. T is sitting third to the right of P. The one who owns Lambretta is second to the left of the one who owns Lycan. Y owns Lycan and is sitting exactly between P and L. The one who owns Punto is sitting second to the right of N. The one who owns Ariel is second to the right of the person who owns Garmin. P sits third to the left of the person who owns VW. Neither Q nor L is the immediate neighbour of N. Q is fourth to the left of L. N does not own Creta or Ariel. The person who owns Lambretta is sitting second to the right of the person who owns Creta. R owns Lambretta and he is not an immediate neighbour of N.

5. Who sits fourth to the right of L?
- (A) P
 - (B) Y
 - (C) R
 - (D) Q
 - (E) None of these
6. Which of the following cars does N own?
- (A) Punto
 - (B) Scorpio

- (C) Garmin
- (D) VW
- (E) Lycan

7. What is P's position with respect to Q?

- (A) Third to the left
- (B) Fifth to the left
- (C) Second to the right
- (D) Third to the right
- (E) Fourth to the left

8. Which of the following combinations is correct?

- (A) R – Garmin
- (B) Y – Creta
- (C) N – Scorpio
- (D) T – Ariel
- (E) All are true

Directions for Questions 9–12: Read the following information and answer the questions that follow.

Sarah, Caitlin, Megan, Amy, Jessica, Emma, Amber and Zoe are sitting around a circular table facing the centre. Each one of them has a favourite fruit or vegetable—dandelion, eggplant, apple, tomato, cherry, spinach, broccoli and beetroot. Sarah sits third to the right of the person who likes tomato. Amy sits second to the left of Amber.

Amber is not an immediate neighbour of the person who likes tomato. Only one person sits between Caitlin who likes spinach and the person who likes tomato.

The person who likes apple sits third to the right of the person who likes spinach. Zoe sits between the person who likes apple and the person who likes eggplant. Jessica is not an immediate neighbour of Zoe.

The person who likes eggplant sits third to the right of the person who likes cherry. Only one person sits between the person who likes broccoli and Emma. Jessica likes neither broccoli nor dandelion.

9. Who sits third to the right of Megan?
- (A) Amber
 - (B) Emma
 - (C) The person who likes dandelion
 - (D) Zoe
 - (E) The person who likes beetroot
10. Which of the following statements must be true?
- (A) Zoe likes dandelion.
 - (B) The person who likes cherry sits to the immediate left of Sarah.
 - (C) Amy sits two places to the right of Amber.
 - (D) Caitlin sits two places to the left of the person who likes tomato.
 - (E) Jessica likes broccoli.
11. What is the position of the person who likes broccoli with respect to Zoe?
- (A) 3rd to the left
 - (B) 4th to the right
 - (C) 5th to the left
 - (D) 4th to the left
 - (E) 2nd to the right
12. Which of the following combinations is not correct?
- (A) Amber - cherry
 - (B) Emma - apple
 - (C) Amy - dandelion
 - (D) Zoe - beetroot
 - (E) Caitlin - spinach

Directions for Questions 13–16: Read the below information and answer the questions that follow.

Six friends—S, R, P, D, M and K—are sitting around a circular sofa. S is sitting opposite to R. P is sitting to the right of R but left of D. M is sitting to the left of R. K is sitting to the right of S and left of M. Now, D and K interchange their positions and so do M and R.

13. Who will be sitting second to the right of D?
- (A) S
 - (B) M
 - (C) R
 - (D) P
 - (E) K
14. Four of the following five pairs are alike in a certain way based on their positions in the above arrangement and so form a group. Which of the following pairs do not belong to the group?
- (A) SR
 - (B) DM
 - (C) PS
 - (D) KM
 - (E) RP
15. Who will be sitting opposite to S?
- (A) R
 - (B) M
 - (C) K
 - (D) D
 - (E) P
16. Who will be sitting to the immediate left of K?
- (A) P
 - (B) D

- (C) R
- (D) S
- (E) None of these

Directions for Questions 17–20: Read the below information and answer the questions that follow.

“Four dogs F, G, H, J and two cats—K and M—will be assigned to exactly six cages numbered 1 to 6. Cage 1 faces Cage 4, Cage 2 faces Cage 5 and Cage 3 faces Cage 6.

The following conditions apply: The cats cannot face each other, else they’ll start fighting. A dog must be put in Cage 1. H must be put in Cage 6. J must be put in a cage whose number is 1 more than the number of K’s cage K and H cannot be opposite each other.”

17. Which one of the following must be true?
- (A) F is assigned to an even numbered cage.
 - (B) F is assigned to Cage 1.
 - (C) J is assigned to Cage 2 or Cage 3.
 - (D) J is assigned to Cage 3 or Cage 4.
 - (E) K is assigned to Cage 2 or Cage 4.
18. If J is assigned to Cage 3, which one of the following could be true?
- (A) F is assigned to Cage 2.
 - (B) F is assigned to Cage 4.
 - (C) G is assigned to Cage 1.
 - (D) G is assigned to Cage 4.
 - (E) M is assigned to Cage 5.
19. Which one of the following must be true?
- (A) A cat is assigned to Cage 2.
 - (B) A cat is assigned to Cage 5.
 - (C) K’s cage is in a different row from M’s cage.
 - (D) Each cat is assigned to an even-numbered cage.

(E) Each dog is assigned to a cage that faces a cat's cage.

20. If K's cage is in the same row as H's cage, which one of the following must be true?

(A) F's cage is in the same row as J's cage.

(B) F is assigned to a lower-numbered cage than G.

(C) G is assigned to a lower-numbered cage than M.

(D) G's cage faces H's cage.

(E) M's cage is in the same row as G's cage.

Directions for Questions 21–24: Based on the information given below, answer the questions that follow. (*Real NMAT Question*)

Five people, Kuldeep, Gaurav, Susmita, Pratima, and Devanshu are working in three branches of a company based at Bangalore, Chennai, and Hyderabad. Two people work in Bangalore and two people work in Chennai. Of these four employees, one works in Accounts and another works in Personnel. The remaining are in Marketing. There are 2 Assistant Managers, one Manager, one Director and one Supervisor.

1. Gaurav is the Director in the Marketing division at Chennai.

2. Pratima is the Manager at neither the Bangalore nor the Chennai branch. She is in the Accounts department.

3. The person in the Personnel department is an Assistant Manager in Bangalore.

4. Susmita is at the Bangalore branch working as Supervisor and Devanshu is at the Chennai branch.

21. Who is in the Personnel department?

(A) Devanshu

(B) Kuldeep

(C) Pratima

(D) Susmita

(E) Gaurav

22. In what capacity is Devanshu working?

- (A) Assistant Manager in Marketing
- (B) Assistant Manager in Personnel
- (C) Supervisor in Marketing
- (D) Director in Marketing
- (E) Manager in Accounts

23. Which of the following is correct about Kuldeep?

- (A) He is the Assistant Manager in Marketing.
- (B) He is the Assistant Manager in Personnel.
- (C) He is the Supervisor in Marketing.
- (D) He is the Director in Marketing.
- (E) He is the Manager in Accounts.

24. Which one is the correct combination?

- (A) Gaurav–Chennai–Accounts
- (B) Pratima–Chennai–Marketing
- (C) Pratima–Chennai–Marketing
- (D) Pratima–Chennai–Marketing
- (E) Kuldeep–Assistant Manager–Personnel

Directions for Questions 25–28: Read the below information and answer the questions that follow on the basis of this information.

Nine people, Richard, Emmanuel, Luke, Andre, Patrick, Ethan, Jason, Shane and Joshua, stay on different floors of a 9-storey building. All of them own one car each, and each car is of a different colour: blue, white, grey, black, green, yellow, orange, red and pink, not necessarily in that order. The ground floor is numbered 1 and the topmost floor is numbered 9.

- Shane owns a black coloured car and stays on an even numbered floor. Richard stays on any even numbered floor below the floor on which Shane stays. The person who owns the orange coloured car stays on the fourth floor.
- Patrick stays on the second floor and owns the white coloured car. The person who owns a pink coloured car stays on the third

floor. Richard does not own a green coloured car. There are two floors between the floors on which the people owning the red and the black coloured cars stay.

- Luke owns a grey coloured car. There are three floors between the floors on which Luke and Jason stay. Andre stays on a floor immediately above Joshua's floor. There is one floor between the floors on which Ethan and Jason stay.
- Ethan does not own the pink coloured car and does not stay on the ground floor. The person who owns the blue car stays on the top-most floor.

25. Who stays on floor number 8?

- (A) Emmanuel
- (B) Andre
- (C) Richard
- (D) Ethan
- (E) Shane

26. How many persons are staying between Jason and Emmanuel?

- (A) Three
- (B) Four
- (C) Two
- (D) One
- (E) None of these

27. Who stays on the floor immediately below Joshua's floor?

- (A) Ethan
- (B) Andre
- (C) Patrick
- (D) Richard
- (E) Emmanuel or Luke

28. Who owns the yellow coloured car?

- (A) Andre

- (B) Ethan
- (C) Emmanuel
- (D) Richard
- (E) Luke

Directions for Questions 29–32: Read the following information and answer the questions that follow.

Seven friends—P, T, M, J, V, R and W—are pursuing B.Com, B.A. and B.Sc courses. Three of them are pursuing B.Com, two are pursuing B.A. and two are pursuing B.Sc. Each of them has a favourite musical instrument ranging from banjo, sitar, guitar, flute, violin, saxophone and tabla but not necessarily in the same order. None of those pursuing B.Com like either sitar or violin. M is pursuing B.A. and he likes banjo. R is pursuing B.Sc and likes tabla. J is pursuing B.Com and likes guitar. P, who does not like sitar, is pursuing the same discipline as R. T is pursuing the same discipline as M. V does not like saxophone.

- 29.** Who among the following is pursuing B.Com?
- (A) J, V and W
 - (B) V, W and T
 - (C) J, V and T
 - (D) J, P and R
 - (E) None of the above
- 30.** What is the favourite musical instrument of M?
- (A) Flute
 - (B) Sitar
 - (C) Guitar
 - (D) Banjo
 - (E) Saxophone
- 31.** What are the favourite musical instruments of those who are pursuing B.Sc?

- (A) Guitar and Violin
- (B) Sitar and Tabla
- (C) Tabla and violin
- (D) Flute and sitar
- (E) Violin and saxophone

32. Which of the following combinations is correct?

- (A) J – B.A. - Guitar
- (B) M – B.Com - Banjo
- (C) T – B.A. - Tabla
- (D) T – B.Sc - Sitar
- (E) W – B.Com - Saxophone

Directions for Question 33: A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g., ‘N’ can be represented by 10, 40 etc. and ‘S’ can be represented by 14, 44 etc. Similarly, you have to identify the set for the word NOISE.

Matrix I					
	0	1	2	3	4
0	R	E	O	N	G
1	N	P	V	E	S
2	M	T	I	O	N
3	E	A	I	C	O
4	N	T	A	R	S

Matrix II					
	5	6	7	8	9
5	G	V	E	A	C
6	R	O	N	S	S
7	M	N	E	S	I
8	O	T	I	T	A
9	N	S	N	E	P

- (A) 76, 85, 79, 68, 78
- (B) 40, 66, 87, 79, 96
- (C) 10, 24, 30, 44, 01

(D) 40, 85, 79, 96, 77

(E) None of these

Directions for Questions 34–35: In each of the following questions a word is represented by a set of numbers selected from Matrix I and Matrix II. Each number is representing on alphabet in the matrices choose the set of numbers from the alternatives the represent the each alphabet of the word. The column and rows of Matrix I are numbered from 0 to 4 and those of Matrix II from 5 to 9. In the matrices for N can be coded as 04, 14, 22 etc. Similarly, you have to identify the correct set for the words given in each question.

Matrix I					
	0	1	2	3	4
0	L	F	A	T	N
1	F	A	T	L	N
2	A	T	N	F	L
3	T	N	F	L	A
4	A	T	L	F	N

Matrix II					
	5	6	7	8	9
5	A	U	S	E	O
6	U	E	A	O	S
7	E	A	U	S	O
8	O	S	E	A	U
9	S	E	O	U	A

34. FAST

(A) 01, 23, 20, 41

(B) 43, 40, 78, 98

(C) 23, 20, 69, 42

(D) 01, 34, 69, 41

(E) None of these

35. LEAN

(A) 33, 42, 59, 97

(B) 13, 66, 20, 31

(C) 42, 97, 20, 34

(D) 00, 85, 88, 99

(E) None of these

Directions for Questions 36–39: Answer the questions that follow based on the information given below. (*Real NMAT Question*)

There are seven trees named A, B, C, D, E, F and G in a garden. It is known that these trees have their heights in an increasing order, which may not be the same as the order of their names. It is also known that their heights in feet are seven consecutive integral values, between 1 and 10 (both inclusive). Tree A is 3 feet taller than tree D. Tree B stands in the middle of the row of seven. The difference in the heights of tree F and tree B, tree F being shorter, is same as the difference between the heights of tree C and tree D, tree C being taller. Tree F is shorter than tree G.

- 36.** The difference in the heights of tree E and tree B is the same as the difference between the heights of tree D and which tree?

(A) A
(B) B
(C) C
(D) E
(E) None of these

- 37.** The difference in the heights of tree G and tree D, in inches, is:

Note: 12 inches = 1 foot

(A) 12
(B) 24
(C) 48
(D) Cannot be determined
(E) None of these

- 38.** The sum of heights of tree F and tree G, in feet, is:

(A) 4
(B) 6
(C) 48
(D) Cannot be determined

(E) None of these

- 39.** The maximum possible height of tree A is greater than the least possible height of tree F by how many feet?

(A) 5

(B) 6

(C) 7

(D) 8

(E) None of these

- 40.** Find out the two signs to be interchanged in order to make the following equation correct:

$$8 + 7 \times 6 / 16 - 8 = 48$$

(A) + and –

(B) – and /

(C) + and x

(D) + and /

(E) None of the above

- 41.** If $\times$ stands for 'addition', $\div$ stands for 'subtraction', $+$ stands for 'multiplication' and $-$ stands for 'division', then $40 \times 16 \div 16 - 8 + 10 = ?$

(A) 5

(B) 24

(C) 25

(D) 36

(E) 80

- 42.** Manage the mathematical symbol to solve this puzzle:

$$16 * 8 * 2 * 3 * 4 = 8$$

(A) $\times + \div -$

(B) $\times \div + -$

(C) $- \div + \times$

(D) $- \div \times +$

(E) $\div - \times +$

- 43.** If '+' means ' $\div$ ', ' $\times$ ' means '+', '-' means ' $\times$ ' and ' $\div$ ' means '-' then, which of the following will be the correct equation?

(A) $20 + 25 \div 15 \times 4 - 6 = 10$

(B) $20 - 5 \times 10 \div 20 + 4 = 20$

(C) $50 + 10 - 5 \div 5 \times 20 = 40$

(D) $15 - 5 \times 50 + 25 \div 10 = 40$

(E) None of these.

- 44.** If + means $\times$, $\div$ means $-$, $\times$ means $\div$ and $-$ means $+$, what will be the value of $16 + 5 \div 9 \times 3 - 20 = ?$

(A) 42

(B) 66

(C) 77

(D) 97

(E) 103

- 45.** By using your numerical and logical reasoning skills please try to figure out which number is missing in the questions below. The numbers around will give you the clues you need to solve the puzzle.

$$16 \div 4 = 144$$

$$15 \div 3 = 144$$

$$10 \div 2 = 64$$

$$20 \div 5 = ?$$

(A) 169

(B) 100

(C) 196

(D) 225

(E) 256

Directions for Questions 46–49: A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.

Input: gas net 54 36 17 fan act 65

Step 1: 65 gas net 54 36 17 fan act

Step 2: 65 act gas net 54 36 17 fan

Step 3: 65 act 54 gas net 36 17 fan

Step 4: 65 act 54 fan gas net 36 17

Step 5: 65 act 54 fan 36 gas net 17

Step 6: 65 act 54 fan 36 gas net 17

Step 7: 65 act 54 fan 36 gas 17 net

46. What will be step 3 for the following input?

can axe 32 12 kit 57 bat 89

- (A) 89 axe 57 bat 32 can 12 kit
- (B) 89 axe 57 bat can 32 12 kit
- (C) 89 axe can 32 12 kit 57 bat
- (D) 89 axe 57 can 32 12 kit bat
- (E) 89 can axe 32 12 kit 57 bat

47. How many steps will be needed to complete the following arrangement?

76 cot 64 dog 45 hen 54 urn

- (A) 1
- (B) 2
- (C) 3
- (D) 4

(E) 5

48. If step 3 of an input is as given below, which of the following must have definitely been the input?

76 gap 56 ink 14 leg 22 oxe

- (A) oxe 56 ink 56 leg 22 gap 76
- (B) 56 ink 56 leg 22 gap 76 oxe
- (C) 56 76 ink oxe 56 leg 22 gap
- (D) 22 gap 76 oxe 56 ink 56 leg
- (E) Cannot be determined

49. What will be last step for the following input?

tie 56 mat 99 pot 33 jut 22

- (A) jut 99 mat 56 pot 33 tie 22
- (B) 99 jut 56 pot 33 mat 22 tie
- (C) 99 tie 56 pot 33 mat 22 jut
- (D) 99 jut 56 mat 33 pot 22 tie
- (E) 22 jut 33 mat 56 pot 99 tie

Directions for Questions 50–53: A machine processed the following input according to a certain rule to reach a final output.
(Real NMAT Question)

Input: 32, panorama, 48, casualty, 23, wide, 4, nation, routine

Step I: casualty, 32, panorama, 48, 23, wide, nation, routine, 4

Step II: casualty, nation, 32, panorama, 48, wide, routine, 4, 23

Step III: casualty, nation, panorama, 48, wide, routine, 4, 23, 32

Step casualty, nation, panorama, routine, wide, 4, 23, 32, 48

IV:

Step IV is the final output.

A new input is processed by the machine on the basis of the same rule.

New Input: 29, zoo, 36, yeast, 9, prices, 16, manoeuvre, toxicity

- 50.** Which of the following will be Step II for the new input?
- (A) manoeuvre, 29, zoo, 36, yeast, prices, 16, toxicity, 9
 - (B) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 9, 16
 - (C) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 16, 9
 - (D) manoeuvre, 29, zoo, 36, yeast, prices, toxicity, 9, 16
 - (E) manoeuvre, prices, zoo, 36, yeast, toxicity, 29, 16, 9
- 51.** Which of the following will be the final output for the new input?
- (A) Step III
 - (B) Step IV
 - (C) Step V
 - (D) Step VI
 - (E) Step VII
- 52.** Which will be the correct sequence of numbers from left to right in Step III of the new input?
- (A) 36, 16, 9, 29
 - (B) 36, 9, 16, 29
 - (C) 29, 36, 9, 16
 - (D) 36, 29, 9, 16
 - (E) 9, 16, 36, 29
- 53.** Which of the following is Step-II in reverse order for the new input?
- (A) 9, 16, toxicity, yeast, 36, zoo, 29, manoeuvre, prices
 - (B) 29, 36, yeast, toxicity, 16, 9, zoo, manoeuvre, prices

- (C) 16, 9, yeast, toxicity, 36, 29, zoo, prices, manoeuvre
- (D) 9, 16, manoeuvre, prices, 29, zoo, 36, yeast, toxicity
- (E) 16, 9, toxicity, yeast, 36, zoo, 29, prices, manoeuvre

Directions for Questions 54–57: A word and number arrangement machine when given an input line of words and numbers rearranges them based on a certain rule. The following arrangement illustrates the pattern of steps that the machine follows.

Input: team 40 member appeared 15 all 30 power 25 sentences borings

Step I: all team member appeared 15 30 power 25 sentences borings 40

Step II: all team power member appeared 15 25 sentences borings 40 30

Step III: all team power member borings appeared 15 sentences 40 30 25

Step IV: all team power member borings appeared sentences 40 30 25 15

Step IV: is the final output of the above input.

Answer the questions that follow assuming that the new input given below is processed by the machine in the same manner.

Input: Procedures 80 doctors 50 would operation 75 45 American review

- 54.** What is the position of 'American' in Step V?
- (A) Fourth from the right
 - (B) Fourth from the left

- (C) Sixth from the right
- (D) Fifth from the right
- (E) None of these

55. How many steps will be required to complete the arrangement?

- (A) Three
- (B) Four
- (C) Five
- (D) Six
- (E) None of these

56. In a certain way in Step III, 'doctors' is related to '80' and 'review' is related to '75'. In the same way 'would' is related to which of the following?

- (A) American
- (B) 45
- (C) 50
- (D) operation
- (E) None of these

57. How many words/numbers are there in between 'procedures' and '50' in step IV?

- (A) Three
- (B) Four
- (C) Five
- (D) Six
- (E) Seven

Directions for Questions 58–61: A computer programme converts an input series into an output in six steps using a certain logic as illustrated below. **(Real NMAT Question)**

Input	1234	5678	2345	6789	3456
Step 1	10	26	14	30	18
Step 2	JJ	ZZ	NN	DD	RR
Step 3	1224	5652	2331	6759	3438
Step 4	25	90	23	191	98
Step 5	Y	L	W	I	T
Step 6	1	14	3	17	6

Use the same logic for the new input below to answer the question that follows.

New Input	1203	3211	4522	1111	6666

58. What is the value of the fourth element in the third step?
- (A) 1078
(B) 1107
(C) 3204
(D) 4509
(E) 6642
59. Which element of which Step would have the value 29?
- (A) 1st element of Step 1
(B) 1st element of Step 2
(C) 5th element of Step 1
(D) 2nd element of Step 3
(E) 2nd element of Step 4
60. If the new input element '1203' was changed to '3210', what would be the 1st element of Step 5?
- (A) B
(B) C
(C) D
(D) E

(E) F

61. If the new input series was '3021, 1123, 2254, 2222, 5555', what would Step 4 be?

(A) 86, 52, 39, 31, 35

(B) 83, 51, 39, 31, 35

(C) 71, 83, 35, 25, 25

(D) 35, 39, 25, 25, 84

(E) 52, 39, 35, 25, 84

Directions for Questions 62–65: A computer programme converts an input series into an output in five steps as shown below. Study the logic and answer the question that follows. **(Real NMAT Question)**

Input	9	25	49	16	1	81
Step 1	3	5	7	4	1	9
Step 2	11	17	23	14	5	29
Step 3	14	22	30	18	6	38
Step 4	30	46	62	38	14	78
Step 5	5	7	9	6	3	11

62. If the fourth input element is 64, what is the final output of step 5?

(A) 2

(B) 4

(C) 6

(D) 8

(E) 10

63. If the output in step 5 of a given input is 15, then what was the initial input for this element?

(A) 100

(B) 123

(C) 131

(D) 152

(E) 169

64. If the output in step 5 is 13, 15, 16, 17, 18, 19, then the input series is:

(A) 22, 24, 25, 26, 27, 99

(B) 25, 35, 67, 82, 91, 89

(C) 100, 103, 130, 143, 153, 200

(D) 102, 145, 154, 176, 191, 201

(E) 121, 169, 196, 225, 256, 289

65. Due to a machine malfunction, if Step 2 of an output series got written backwards, with the last element appearing first and the first element appearing last, and it read 44, 38, 32, 26, 14, 8, then what was the input series?

(A) 196, 144, 100, 64, 16, 4

(B) 4, 16, 36, 64, 100, 144

(C) 9, 81, 64, 100, 144, 196

(D) 4, 16, 64, 100, 144, 196

(E) 144, 100, 64, 36, 16, 4

4 Other Reasoning

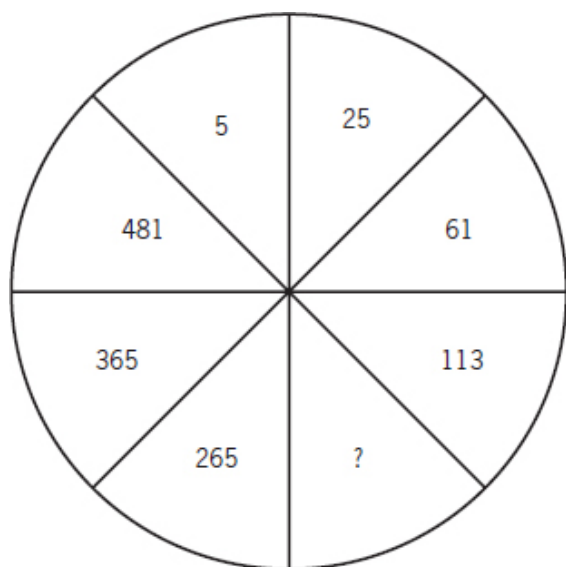
1. What number should come in place of the question mark?

2	3	1	2
3	4	4	5
5	6	6	7
30	43	51	?

- (A) 52
(B) 56
(C) 62
(D) 65
(E) 70
2. What number should come in place of the question mark?

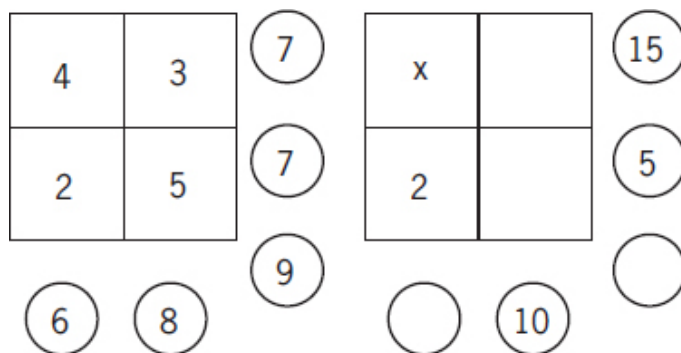


- (A) 29
(B) 37
(C) 41
(D) 47
(E) 53
3. What number should come in place of the question mark?



- (A) 121
- (B) 144
- (C) 164
- (D) 181
- (E) 221

4. Each circled number is the sum of the adjacent row, column or diagonal of the numbers in the square display. (**Real NMAT Question**)

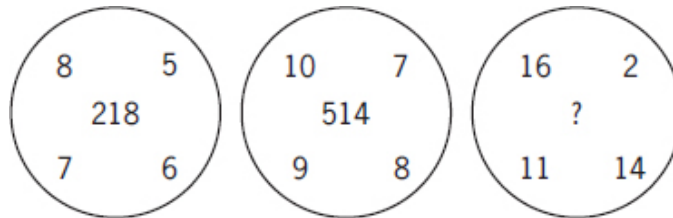


What is value of x in the above diagram?

- (A) 7
- (B) 8
- (C) 9
- (D) 10

(E) 11

5. Which number should replace the question mark? (*Real NMAT Question*)



- (A) 286
(B) 296
(C) 304
(D) 324
(E) 356

6. In the figure below, what is the value of 'X + Y'? (*Real NMAT Question*)

12	8	23	3	4
9	6	7	18	10
7	11	22	3	X
14	15	8	12	1
12	13	9	Y	7
8	7	12	14	9

- (A) 12
(B) 14
(C) 16
(D) 18
(E) 28

Directions for Questions 7–9: In a company 580 employees are working. The admin of company survey colour for T-shirt distribution. 200 employees like red, 250 employees like pink and 350 employees like yellow. 80 employees like red and pink, 120

employees like pink and yellow and 60 employees like yellow and red. Every Employee likes atleast one of the three T-shirt.

7. The number of employees who like only red is:
 - (A) 60
 - (B) 50
 - (C) 40
 - (D) 30
 - (E) 100
8. The number of employees who like only pink is:
 - (A) 30
 - (B) 40
 - (C) 50
 - (D) 90
 - (E) None of these
9. The sum of the number of employees who like only yellow and all three is:
 - (A) 180
 - (B) 190
 - (C) 170
 - (D) 110
 - (E) None of these

Directions for Questions 10–13: Answer these questions on the basis of the information given below:

1200 students of a college are involved in playing three games. These students are grouped under the following categories.

Game	Number of students
Cricket	400
Hockey	600
Football	800

- The following information is also available.
- The number of players who play Cricket and Hockey is three times the number of players who play all 3 games.
- The number of players who play Cricket and Football is two times the number of players who play all 3 games.
- 300 players play only Hockey.
- The ratio of number of players who play only Cricket to only Football is 2:7.

10. How many student play Cricket and Football?

- (A) 100
- (B) 200
- (C) 150
- (D) 300
- (E) None of these

11. What is the 20% of students who play Cricket and Hockey?

- (A) 10
- (B) 20
- (C) 15
- (D) 30
- (E) None of these

12. The number of student who play Hockey and Football is:

- (A) 50
- (B) 100
- (C) 180
- (D) 120

(E) None of these

13. What is the difference between those who play all three games and those who play Hockey only?

(A) 150

(B) 240

(C) 250

(D) 300

(E) None of these

14. Out of 140 mechanics, 10% can repair all three devices – Air Conditioner (AC), Television (TV) and Refrigerator. The number of mechanics who can repair exactly 2 of 3 electronic devices is 50. The number of mechanics who can repair only TVs is 22. The number of mechanics who can repair only ACs is equal to the number of mechanics who can repair only Refrigerators.

How many mechanics can repair only ACs, if each mechanic can repair at least 1 of the 3 electronic devices? (**Real NMAT Question**)

(A) 22

(B) 24

(C) 26

(D) 27

(E) 29

15. Out of a total of 150 students in a school, 43 students passed only Pre Medical Test (PMT), 29 passed only Pre Engineering Test (PET), and 62 passed only Pre Pharmacy Test (PPT). Six students passed all the three tests. 4 students did not pass PMT but passed the other two tests. PPT was passed by 50% of the students. A total of 55 students passed PMT. How many students passed both PMT and PET? (**Real NMAT Question**)

(A) 3

(B) 4

(C) 5

- (D) 6
- (E) 10

16. If $\frac{3}{4}$ of all the chocolates have nuts and $\frac{1}{3}$ of all the chocolates have both nuts and fruits, then what fraction of all the chocolates has nuts but no fruits?

- (A) $\frac{1}{4}$
- (B) $\frac{5}{12}$
- (C) $\frac{1}{2}$
- (D) $\frac{7}{12}$
- (E) $\frac{5}{6}$

17. In a class, the ratio of the number of boys having mobile phones to the number of girls having mobile phones is 5 : 2. There are a total of 100 students in the class and only 35 students of them have one mobile phone each in their possession. If the boys form only the $\frac{3}{5}$ th part of the class, then what percentages of the girls in the class have mobile phones?

- (A) 20%
- (B) 24%
- (C) 25%
- (D) 40%
- (E) 50%

18. In a class of 100 students, 60 students like Physics whereas 45 students like Chemistry. Five students don't like either Physics or Chemistry. How many students like both Chemistry and Physics?

- (A) 0
- (B) 5
- (C) 10
- (D) 15
- (E) 20

- 19.** A survey of 500 students of DMP University, produced the information that 285 students study MBBS, 195 study BHMS, 115 study BAMS, 45 study MBBS and BAMS, 70 study MBBS and BHMS, 50 study BHMS and BAMS, and 50 study none of the three subjects. How many students study all the three subjects?
- (A) 10
(B) 15
(C) 18
(D) 20
(E) 25
- 20.** There are certain number of students in BRT University. Of all, 25 students study Quant, 12 study English, and 18 study Reasoning. Of these, 10 students study both Quant and English, 9 study both English and Reasoning and 14 study both Reasoning and Quant. If 8 students study all the three subjects, how many students are there in the class?
- (A) 28
(B) 29
(C) 30
(D) 31
(E) Cannot be determined
- 21.** Several incidents of ragging have been reported from medical colleges in the state. The situation has turned serious as a lot of suicides have been committed due to these incidents.

Which of the following will be an appropriate decision that should be adopted by the government in this scenario?

- (A) The government should ignore these incidents as ragging helps build a bond between senior and junior students.
- (B) The government should issue strong guidelines and ensure that colleges take strict action against those found guilty of ragging.
- (C) These matters are not that important and are a result of the media-hype generated by over-sensitive parents.

- (D) The medical colleges where the cases of ragging have been reported should be shut down and an inquiry should be conducted.
- (E) The government has no role in this matter as this issue falls within the purview of college authorities.

- 22.** There is a huge amount of garbage dumped on the northern side of Mount Everest from where thousands of climbers attempt to climb the summit every year.

The organizing authorities are deeply concerned about the condition of this natural marvel and have met to agree on a further course of action? Which of the following will be an appropriate decision to address this concern?

- (A) The climbers should be encouraged to climb from the southern side of the mountain instead.
- (B) There should be a complete ban on any climbing activity on Mount Everest as it a natural marvel that needs to be preserved.
- (C) All mountain-climbing activities on Mount Everest should be suspended for a few years so that the mountain can recuperate.
- (D) The authorities should invest in having the mountain-side cleaned up and issue guidelines to ensure that garbage is not accumulated on the mountain-side.
- (E) The mountain has been there far longer than humans and we should let nature take its course.

- 23.** Lately, there have been several incidents in which many doctors have recommended medicines manufactured by those companies that offer huge commissions to them. The medical council has received numerous complaints from aggrieved parties that have been forced to purchase these medicines at higher costs.

Which of the following would be an apt decision on the part of the medical council?

- (A) Put a complete ban on the payment of commission by medicine companies to doctors.

- (B) Ignore the complaints-Becoming a doctor is an extremely expensive process. It is okay if they find a way to earn some extra money.
- (C) There have been no reports of these medicines causing any harm to the patients. Therefore, this practice should be allowed to continue.
- (D) The board should encourage this practice as it incentivises the doctors to recommend effective medicines. At the same time, the patients will also benefit by recovering quickly.
- (E) The medical council can make it compulsory for the doctors to prescribe medicines that are commonly available in those localities.

24. Many small-scale sector units in India become unviable and close down resulting in huge loss to both the entrepreneur and the government. **(Real NMAT Question)**

What decision should the government take in this situation?

- (A) The banks should be asked to provide cheaper loans to the small-scale sector units.
- (B) The government should appoint a technical committee to find out the reasons for the units' closure.
- (C) The entrepreneurs should be encouraged to restart their ventures as one should not give up after a failure.
- (D) The government should give contracts only to multinationals to develop the small-scale sector units in India.
- (E) The government should discourage the small-scale sector units in India as it eventually results in losses and failed entrepreneurship.

25. A team leader has left the company and the manager urgently needs to put a replacement in place. A precious amount of time in the project has already been lost and the product launch has already been announced by the client. Stakes are high and time is at a premium. Besides, the team which comprises of very highly skilled individuals is becoming edgy due to the sheer pressure.

What decision should the manager take if they have to choose between a person with very high people management and interpersonal skills and a person known to be short-tempered but highly skilled in multiple domains to be used in the project? (**Real NMAT Question**)

- (A) Choose the person with multiple domain expertise – different team members would need support in different domains to complete the work.
- (B) Choose the person with people management skills – both the team and the client would need high levels of engagement.
- (C) Choose the person with multiple domain expertise – the team would need such a person, should anyone else leave.
- (D) Choose the person with multiple domain expertise – a lot of time has already been lost and time is at a premium.
- (E) Choose neither – you need to seek HR intervention, advertise and get someone else recruited at the earliest.

26. Five stations, P, Q, R, S and T, are located on a highway but not necessarily in the same order. Q is the middle station which is towards the immediate left of R. S is not the first station but is towards the left of Q. T is towards the right of S. Which station is located to the immediate left of S? (**Real NMAT Question**)

- (A) P
- (B) R
- (C) T
- (D) Either P or T
- (E) Either P or R

27. In the series given below, which is the 5th element to the left of the 10th element to the right of the 4th element from the left?

AB46^&DKL* @BHD1987&%+A+V+W&X123*& (**Real NMAT Question**)

- (A) A
- (B) D
- (C) 8

- (D) L
- (E) &

Directions for Questions 28–31: Read the statements given below carefully and answer the following question by choosing the correct alternative among the given five options.

Ten friends are sitting on two parallel lines in such a way that A, B, C, D, E are facing front while P, Q, R, S, T are sitting in the other line and facing the the formers. S is sitting second to the right of P. T is not the neighb our of P or S. There is one person between S and T. D is facing R. C and E are neighbours. B is at the right end of the row. A is facing P. D is not adjacent to B. E is not facing S.

- 28.** Which of the following are sitting on the ends of the row facing north?
- (A) A, B
 - (B) R, S
 - (C) P, T
 - (D) P, Q
 - (E) R, S
- 29.** Who among the following in facing E?
- (A) P
 - (B) R
 - (C) S
 - (D) T
 - (E) Q
- 30.** Which of the following is true regarding C?
- (A) C is facing Q
 - (B) Q is second to the right of the person facing C
 - (C) C is sitting at the centre of the line
 - (D) C is at the right end of the line
 - (E) None of these

31. Which of the following is third to the left of T?

- (A) P
- (B) R
- (C) S
- (D) A
- (E) Q

Directions for Questions 32–34: Read the statements given below carefully and answer the following question by choosing the correct alternative among the given five options.

Eight friends P, Q, R, S, T, U, V, and W are sitting around a circular table. Four are not facing the centre. P is sitting fourth to the left of T. T is facing outside. S is immediate neighbour of R. Q is second to the right of S. W is sitting second to the right of U and immediate left of P. U is facing outside and not an immediate neighbour of P. Both the neighbours of U face outside. S faces the centre.

32. What is the position of Q with respect to W?

- (A) Second to the right
- (B) Third to the left
- (C) Second to the left
- (D) Third to the right
- (E) None of these

33. How many people are there between P and T?

- (A) One
- (B) Two
- (C) Three
- (D) Four
- (E) Five

34. Who are facing outside?

- (A) P, Q, T, U

- (B) Q, R, W, S
- (C) Q, T, W, V
- (D) P, T, V, Q
- (E) P, T, U, V

Directions for Questions 35–38: Read the following information and answer the questions that follow.

Seven friends Aman, Bimal, Chandu, Disha, Esha, Fulla and Geeta, stay on different floors of a 7-storey building. The ground floor is numbered 1 and the topmost floor is numbered 7.

The following information is also considered:

- Bimal stays on an odd numbered floor but just below the floor on which Disha stays.
- Geeta stays on an even number floor but below the floor on which Bimal stays.
- There is one floor between the floors on which Chandu and Disha stay.
- The sum of the floor numbers on which Aman and Bimal stay is 8.
- Fulla stays just above the floor on which Disha stays.

35. What is the sum of the floor numbers on which Esha and Chandu stay?

- (A) 4
- (B) 5
- (C) 7
- (D) 6
- (E) None of these

36. The number of persons between Geeta and Disha is

- (A) One
- (B) Two
- (C) Three
- (D) Four

(E) None of these

37. The square of the floor number of Esha is:

- (A) 1
- (B) 4
- (C) 9
- (D) 16
- (E) 25

38. Aman stays just above which of the following persons?

- (A) Esha
- (B) Geeta
- (C) Chandu
- (D) Bimal
- (E) None of these

Directions for Questions 39–42: Seven students A, B, C, D, E, F and G take an exam. They all get marks between 50% and 95%. A gets marks more than G but less than E. C gets 10% marks less than B but 10% marks more than F. G does not get minimum marks. C gets marks at fourth rank which was 70%. The highest marks is scored by E which is 10% more than B. Score of A is between 70% and 80%. F scored the second lowest marks.

39. Who scored lowest marks?

- (A) B
- (B) D
- (C) F
- (D) G
- (E) None of these

40. Which one of the following options is correct?

- (A) The marks of B is between 70% and 75%.
- (B) The marks of C is between the score of A and E.

- (C) The marks of D is between 50% and 60%
- (D) The marks of A is between 80% and 90%
- (E) None of these

41. The marks scored by G lies between?

- (A) 50% and 70%
- (B) 60% and 70%
- (C) 50% and 60%
- (D) 70% and 90%
- (E) None of these

42. The second highest marks is scored by whom?

- (A) A
- (B) B
- (C) G
- (D) F
- (E) None of these

43. How many pairs of letters in the word 'STAIRS' have as many letters between them (in either direction) in the word as in the English alphabet?

- (A) None
- (B) 1
- (C) 2
- (D) 3
- (E) More than 3

44. How many pairs of letters are there in the word 'DEFAMATION' such that in the word, each pair has as many letters between them as there are in the alphabet? (**Real NMAT Question**)

- (A) 1
- (B) 2
- (C) 3

(D) 4

(E) 5

Directions: Choose the pair that best represents a similar relationship to the one expressed in the original pair of words/alphabets.

45. BDFH:: YWUS: EGIJ:?

(A) USQP

(B) VTRQ

(C) VWYZ

(D) VTSR

(E) YWVU

46. Which one of the following option comes in the place of question mark (?)?

ACDG, CAFE, EYHC, GWJA, ?

(A) HULY

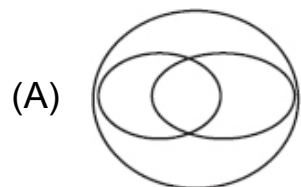
(B) IVLY

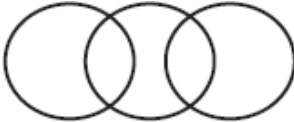
(C) IULZ

(D) IULY

(E) IUMY

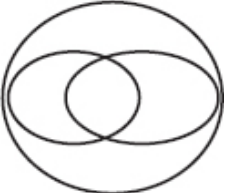
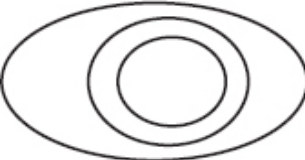
47. Which of the following diagrams indicates the best relation between Doctors, Mothers and Fathers.



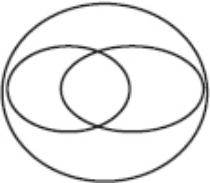
- (C) 
- (D) 
- (E) None of these

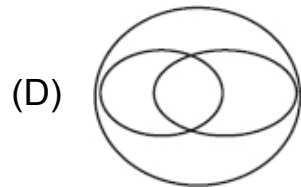
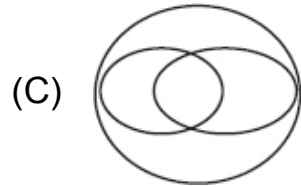
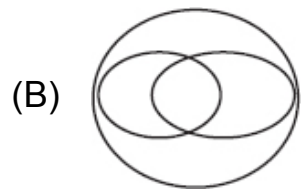
Directions for Questions 48–49: In each of the following questions, the three given words are related in one of the five ways represented by the diagrams given below. Choose the correct diagram which depicts the exact relation among the objects.

48. Grandmother, Mother, Girls

- (A) 
- (B) 
- (C) 
- (D) 
- (E) None of these

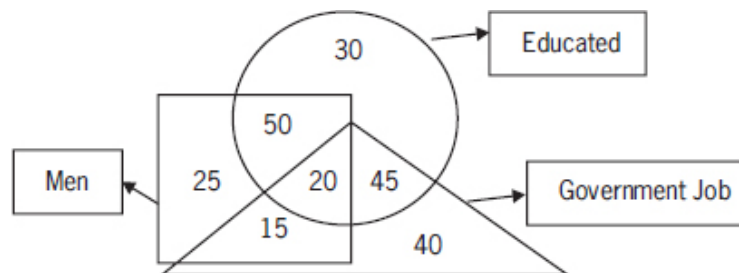
49. Children, Humans, Animals

- (A) 



(E) None of these

Directions for Questions 50–51: Study the following figure and answer the questions given below.



50. How many educated men are in government job?

- (A) 25
- (B) 20
- (C) 50
- (D) 30
- (E) 35

51. Find the number of people in government job who are not educated.

- (A) 35
- (B) 40
- (C) 50

(D) 55

(E) 65

- 52.** The following question has a few statements followed by conclusion. Read the statements and logically select the conclusions that follow the statements.

Statements:

Some cars are trucks.

All trucks are airplanes.

Some airplanes are trains.

No car is a train.

Conclusions:

- (A) All cars are airplane
- (B) All trucks are trains
- (C) All trains being airplanes is a possibility.
- (D) No truck is a train
- (E) None of these.

Directions for Questions 53–55: In each of the questions below, three statements are followed by three or four conclusions. Decide which of the given conclusion(s) logically follow(s) from the given statements, and hence is/are true.

53. Statements:

(1) Some parks are ground.

(2) No ground is sky.

(3) All sky are walls

Conclusion I Some walls are parks.

Conclusion II Some sky are parks.

Conclusion III No wall is a park.

- (A) Either conclusion I or III follows
- (B) Either conclusion II or III and conclusion I follows
- (C) Only conclusion II follows
- (D) Only conclusion III follows
- (E) None follows

54. Statements:

- (1) Some gifts are box.
- (2) All cream are grapes.
- (3) Some cream is box.

Conclusion I Some cream are gift.

Conclusion II Some grapes are box.

Conclusion III No cream is gift.

- (A) Either conclusion I or III and II follows
- (B) Only conclusion II follows
- (C) Conclusion III follows
- (D) Either conclusion I or III follows
- (E) None follows

55. Statements:

- (1) Some print are wrong.
- (2) All wrong are deform.
- (3) No deform are right.

Conclusion I Some print are deform.

Conclusion II Some print are right.

Conclusion III Some deform are wrong.

Conclusion IV All deform are wrong.

- (A) Only conclusion IV follow
- (B) Conclusions I and II follow
- (C) Conclusions I and III follow
- (D) None follows
- (E) Conclusion III follows

Directions for Questions 56–60: In each of the questions/set of questions below, statements are given followed by the conclusions numbered accordingly. You have to assume all the statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the information given in the statements. Give answer.

- (A) If only conclusion I follows.
- (B) If only conclusion II follows.
- (C) If either conclusion I or II follows.
- (D) If neither conclusion I nor II follows.
- (E) If both conclusions I and II follow.

56. Statements:

- (1) All ships are goats.
- (2) All goats are cows.
- (3) No goat is a horse.

Conclusion I Some horses are cows.

Conclusion II No horse is a cow.

57. Statements:

- (1) Some stones are rocks.
- (2) Some rocks are rings.

Conclusion I Some stones are rings.

Conclusion II Some rocks are stones.

58. Statements:

- (1) Some grapes are strawberries.
- (2) All strawberries are oranges.
- (3) Some oranges are apples.

Conclusion I All strawberries are apples.

Conclusion II Some grapes are not strawberries.

59. Statements:

- (1) All sheeps are goats.
- (2) Some goats are dogs.
- (3) All cats are dogs.

Conclusion I No cat is a sheep.

Conclusion II Some cats are goats.

60. Statements:

- (1) No desk is a room.
- (2) Some desks are halls.

Conclusion I Some halls are definitely not desks.

Conclusion II No room is a hall

7.2 Answers and Explanations

The following discussion on answers and explanations is intended to familiarise you with the most efficient and effective approaches to these kinds of questions. Remember that it is the problem solving strategy that is important, not the specific details of a particular question.

1 Critical Reasoning

1. Argument Construction:

The passage states that a multispecialty hospital in a small town had to close its operations due to the shutting down of a software company. We have to look for an option that establishes a link between these two phenomena. Before we look at the options we can ascertain that the shuttering down of the software company should have had some impact either on the earning capacity of the people or their employability. Note that it is a small town and the shutting down of a leading software firm employing more than 10,000 people will have a significant impact on the employment rates of that town which will in-turn impact the purchasing power of the people. Let us consider the options now.

- (A) This option is illogical as there is no plausible relation between the doctors working at the hospital and the software company.
- (B) If this had been the case, then the multispecialty hospital would have continued to flourish as there would have been no dearth of manpower.
- (C) Again, if this statement were true, the multispecialty hospital would have continued to function unaffected.
- (D) This statement is partially correct. We have already established that there has to be some relation between the people working at the software company and the success of the multispecialty hospital. However, the reason provided for this link - most of the diseases originated in the software company, is bizarre and incoherent.
- (E) Correct. Logically, the only connection between the clinic closing down and the software company closing down has to be the fact that the employees of the software company were the regular clientele of the clinic. When the software company shut down, this clientele was lost and so the clinic also had to shut down eventually. E conveys this reasoning and should be the correct answer.

The correct answer is E.

2. Argument Construction:

The argument says that a lot of politicians and bureaucrats have been appointed as the head of various sports institutions which is wrong as they have no knowledge or understanding of the sport and thus they have made some wrong decisions.

This certainly means that the author wants the heads to be people who have knowledge about the sport.

- (A) The argument says both bureaucrats and politicians don't have knowledge of the sport and should not be the head of sports institutions.
- (B) This argument is easily eliminated by the word 'all'. It makes the argument extreme.
- (C) New faces could also be people without knowledge of the sport; therefore this argument doesn't support the question.
- (D) Correct. As discussed, the author assumes that the heads should be people with knowledge of the sport and not politicians. Thus this is the correct option.
- (E) This is an opinion which cannot be inferred from any line of the argument.

The correct answer is D

3. Argument Construction:

St.Kilda, a tiny cluster of islands in the North Atlantic had a harsh climate and severe conditions that made it extremely difficult for its inhabitants to survive there. In 1852, a group of islanders undertook a perilous journey across the sea to find better opportunities.

- (A) The fact that people have been living on St. Kilda for 4000 years contradicts option A.
- (B) Option B assumes facts not stated in the passage, i.e., that St. Kilda is no longer inhabited.
- (C) Similar to option A, Option C also contradicts the information given in the passage.

- (D) Correct. Option D encapsulates the central idea being discussed in the passage: that living on St. Kilda was so tough that some of its inhabitants decided it was too much for them (and chose a risky sea voyage over continuing to stay there). Also, option D uses the words barely and maybe which makes the statement true.
- (E) Though the passage does mention that many of the 36 passengers perished at the sea, it cannot be concluded that the journey was unsuccessful. We have no information regarding this aspect. Hence, it is beyond the scope of the passage.

The correct answer is D.

4. Argument Construction:

There are employees who tend to be self-motivated and those who don't. Irrespective of it, external motivation always helps boost employee productivity.

- (A) Keeping shirkers away may or may not result in better productivity. Therefore this cannot be concluded from the given data.
- (B) Correct. Motivated employees yield better productivity. Hence, this can easily be concluded from the given data.
- (C) Identification alone won't boost productivity. This cannot be concluded from the given data.
- (D) This is an incomplete statement as it does not make any reference to employee motivation. Thus, it cannot be a valid conclusion.
- (E) This statement suggests an extreme measure. Hence, it cannot be a valid conclusion.

The correct answer is B.

5. Argument Construction:

The passage argues that the war on spam has been won. It presents the enhanced security features of google as evidence for this claim.

- (A) The fact that e-mail services will get better at catching spam in the future does not really strengthen this conclusion, as they

are evidently doing the job very well even now. So option A is ruled out.

- (B) Option B is irrelevant, as the paragraph is about spam, not legitimate e-mail.
- (C) Correct. Option C strengthens the conclusion, by showing that even the senders of spam may be slowly acknowledging defeat.
- (D) Option D slightly weakens the argument, as the phrase 'so far' implies that the spam filters may not be able to keep up in the future.
- (E) This option goes beyond the scope of the passage

The correct answer is C.

6. Argument Construction:

Scientists state the advantage of Element Z in manganese and the argument specifies that this element is naturally high in manganese found in Australia. This certainly makes the manganese found in Australia more desirable.

- (A) This option states 'highest'. The argument doesn't give us sufficient data where we can infer Australian manganese having the highest amount of element Z.
- (B) The argument says the level of element Z is high in manganese found in Australia but since we cannot compare it with other countries, this is an incorrect option.
- (C) This option can also be eliminated by the same logic that since no other country is mentioned, we cannot say for sure that Manganese that is not from Australia is very likely to encounter the problem of small breakages.
- (D) There may be other ways of making manganese strong, adding element Z being one of them. So this conclusion becomes uncertain.
- (E) Correct. This statement becomes correct because of the word 'some'. It is a certain conclusion as Australian manganese has high amounts of element Z.

The correct answer is E.

7. Argument Construction:

This is basically a question which tests averages. If the average of A and B is 24%, out of which B is only 6%, then A has to be greater than 24%.

- (A) Since there is no comparison made between A and other brands, this cannot be inferred.
- (B) Talking about prices makes the argument out of scope as there is no mention of it in the argument.
- (C) Correct. By averages, we can certainly conclude this.
- (D) Had this been true, the percentage of B phones would have been higher than A. So this cannot be inferred.
- (E) We cannot say with certainty if the number of people who buy phones may have increased. So this is an incorrect option.

The correct answer is C.

8. Argument Construction:

The exclamation states that anyone who watches a comedy movie will enjoy it.

- (A) The statement doesn't necessarily mean that everyone watches movies.
- (B) Correct. This is correct answer because if we negate this option, the given exclamation loses its stand.
- (C) This is not an assumption but an inference.
- (D) The statement doesn't necessarily that everyone watches only comedy movies.
- (E) It also doesn't suggest that there are no other kinds of movies.

The correct answer is B.

9. Argument Construction:

Curbing of freedom is an undignified thing to do.

- (A) The statement does not mention any subject(s) here. Hence it cannot be implicit in the above case.
- (B) This statement is directly mentioned and thereby not implied.
- (C) This statement contradicts the main statement and therefore is not implied.
- (D) This is a possibility but not an underlying assumption.
- (E) Correct. This is implicit in the main statement. Otherwise, the argument falls apart.

The correct answer is E.

10. Argument Construction:

Researchers have come up with a way to boost natural testosterone production.

- (A) This statement contradicts the question statement. Therefore, it cannot be inferred.
- (B) This may or may not be true. Therefore, it cannot be inferred.
- (C) This is additional information that is beyond the scope of the argument.
- (D) Correct. Since this new testosterone production is mentioned to be one that works “naturally”, the contrast must’ve existed, too. Therefore, it can be inferred.
- (E) This is additional information that is beyond the scope of the argument. Therefore, it cannot be inferred.

The correct answer is D.

11. Argument Construction:

The tigers in National park are always looking for places to lie down.

- (A) Correct. A is the only option from which we can infer that white tigers like to lie around—because they are known to be lazy.
- (B) This statement conflicts with the main statement. If the national park makes tigers active, then the white tigers should also be active.

- (C) This statement again contradicts the main statement, if white tigers hunt their food aggressively, then they will not like to lie around.
- (D) This statement goes beyond the scope of the argument as no comment has been made about other tigers.
- (E) This statement goes beyond the scope of the argument and has no bearing on the main statement.

The correct answer is A.

12. Argument Construction:

Despite a new, more effective laser printing technology being available now, not many companies are willing to adopt it yet.

- (A) The reason why most companies are unwilling to adopt the new technology cannot be guessed. Thereby it is non-implicit.
- (B) Correct. Since the quality of print is not impacting the buyer's mind, this statement is implicit.
- (C) This is additional information, hence non-implicit.
- (D) The reason why most companies are unwilling to adopt the new technology cannot be guessed. Thereby it is non-implicit.
- (E) This is additional information, hence non-implicit.

The correct answer is B.

13. Argument Construction:

The passage discusses the merits and demerits of buying on credit. An advantage that it presents is that buying on credit allows people to benefit from sales and bargain offers when they are short of cash.

- (A) This option merely presents an advantage of buying on credit.
- (B) This option makes an erroneous connection between credit and bargains.
- (C) Correct. This assumption is central to the argument being made by the author. Using credit options to avail oneself of bargains and sales will only prove beneficial if the cost of the credit is less than the savings that the buyer will make. If the cost of

credit exceeds the saving on purchases then there is no point in using such a facility.

- (D) This option is far-fetched and beyond the scope of the argument.
- (E) This is merely a repetition of the main argument.

The correct answer is C.

14. Argument Construction:

The author has made a claim that the reason behind high purchasing power in rural areas as compared to urban areas is that some money used by city dwellers on housing and food can be used somewhere else by rural dwellers.

- (A) Since the money used by urban dwellers on housing and food is used somewhere else by the rural dwellers, this option cannot be true with reference to the rural dwellers.
- (B) The actual income may be the same between rural and urban dwellers, just that their purchasing power varies because of the reason mentioned in the question. So this cannot be inferred.
- (C) Correct. If both rural and city dwellers earn the same income, yet the rural dwellers have a greater purchasing power, it must be because the city dwellers are spending more on food and housing, making C the answer.
- (D) This option can also be eliminated using the same logic used in (B). Their incomes may be the same or may vary.
- (E) The amount of savings will not impact the argument any how as the argument talks of purchasing power, linking it to the expenses on housing and food.

The correct answer is C.

15. Argument Construction:

Reading a certain book is supposedly helpful for MBA aspirants, according to an advertisement.

- (A) If this statement isn't true the question statement will not make sense. Therefore, it is implicit.

- (B) Correct. The word “only” renders this statement incorrect.
- (C) If this statement isn’t true the question statement will not make sense. Therefore, it is implicit.
- (D) If this statement isn’t true the question statement will not make sense. Therefore, it is implicit.
- (E) If this statement isn’t true the question statement will not make sense. Therefore, it is implicit.

The correct answer is B.

16. Argument Construction:

The government has made the tabs stricter on delegates’ foreign travel by putting a ban on foreign travel unless approved by an official of the Secretary level.

- (A) This may or may not be the reason for the said move by the government. Perhaps the reason behind this move is to assess the relative importance and requirement of such visits only.
- (B) The argument makes no claim about discouragement or encouragement of foreign travel. This is additional information and thereby not an assumption.
- (C) The word “only” renders this statement a possibility and therefore not an assumption.
- (D) Correct. The statement clearly mentions ‘austerity measures’. This means that the decision has been taken in a bid to control government’s expenditure.
- (E) This goes beyond the scope of the argument. Austerity measures don’t imply an economic crunch. Also, there is no talk of other measures.

The correct answer is D.

17. Argument Construction:

The passage is talking about the success of a particular loan scheme and uses the growing prosperity amongst the farmers as a barometer of its success.

- (A) The use of the extreme word “only” renders this option incorrect.
- (B) This option is also incorrect because of the use of “only”.
- (C) The passage is talking about this particular loan scheme. From this, we cannot conclude that no such scheme existed earlier. Maybe, similar schemes were there but their terms were not favourable for farmers, or the farmers did not know about them.
- (D) This statement contradicts the information provided in the passage as the passage states that the loan scheme has become quite successful. This means that the farmers are using the scheme to buy tools.
- (E) Correct. Agricultural tools are important for the farmers to carry out a host of farm activities and prosperity for the farmers can only come when these activities are successfully carried out. Therefore, the loan scheme and the prosperity of the farmers are directly linked.

The correct Answer is E.

18. Argument Construction:

The argument draws a correlation between unhealthy habits and the rampant growth of some diseases – like cancer and AIDS.

- (A) Correct. Since it is mentioned that ‘... have plagued mankind due to unhealthy habits’, it gives an indication that diseases like cancer and AIDS have some relation with a person’s lifestyle and food habits; hence, if option (A) is true then unhealthy habits, among other things, may be the cause of these diseases.
- (B) This is a vague statement. The argument is establishing a relation only between certain diseases and habits.
- (C) This is a contradiction of the main argument as it states that people are aware of the reasons that contribute to lifestyle based diseases.
- (D) This option presents another contributing factor (technological advancements) for the spread of diseases.

- (E) This option actually negates the relation established by the main argument.

The correct answer is A.

19. Argument Construction:

Man's reach has expanded where man has been able to reach places like Mars due to technological development and advancement. But what is ironical is that people living on this planet are still struggling for basic facilities like food.

- (A) It is possible that food isn't scarce, just that it isn't distributed properly or equally. Thus, this is an uncertain conclusion.
- (B) This is too much to assume. We don't know if man has gone to Mars in search of food.
- (C) This is not known to us as well.
- (D) This statement is too generic. One cannot conclude if advancements in space, science and agriculture are not at par. The question doesn't give us enough data to conclude this.
- (E) Correct. The basic need in this argument refers to man being hungry on earth despite all the advancement happening around. Thus, this statement is the correct answer.

The correct answer is E.

20. Argument Construction:

Evil eventually results in stupidity. Organisations that misuse power to gain results end up losing smart employees and are left without their best resources.

- (A) Google is mentioned only as an example of the argument, so it has nothing to do with the assumption the argument is based on.
- (B) Correct. This is a basic assumption in the passage: that an organisation that uses its power in order to win unfairly can be characterised as 'evil'
- (C) Option C is clearly stated in the paragraph.
- (D) Option D is tangential to the issue.

- (E) This is an unrelated statement that is beyond the scope of the argument.

The correct answer is B.

21. Argument Construction:

Peter Parker's uncle, Ben, believes that great power entails great responsibility.

- (A) A cannot be assumed because Uncle Ben may be right or not. He is just expressing his opinions.
- (B) B cannot be assumed because may be no one follows Uncle Ben but he still wants to express his opinions.
- (C) C is beyond the scope of the argument.
- (D) D cannot follow because Peter Parker may not listen to his uncle at all but his uncle might wish to communicate with him.
- (E) Correct. As we can see from the statement Uncle Ben is sharing his wisdom and knowledge with Peter Parker. Hence, we can assume that he does this.

The correct answer is E.

22. Argument Construction:

To weaken the argument, we need to give another reason (apart from habitat loss) why the Black Spider Monkey may have become endangered.

- (A) The statement is talking about black spider monkeys and not squirrel monkeys. Hence, this option is beyond the scope of the argument.
- (B) Correct. This option presents another reason for the dwindling number of Black spider monkeys. Hence, it weakens the relationship established between human activities and its impact on the habitat of the monkeys.
- (C) Once again, this is beyond the scope of the argument. The statement is talking about Black spider monkeys only.
- (D) This statement also goes beyond the scope of the argument.

- (E) This statement actually strengthens the main argument by stating that the population of monkeys has revived in areas that are under WWF control, that is, areas that have controlled human intervention.

The correct answer is B.

23. Argument Construction:

The argument establishes a relation between reduced ticket prices and increased aircraft occupancy. It states that one way to reduce pricing is to stop offering in-flight food.

- (A) Not related to the main argument.
- (B) Not related to the main argument
- (C) Correct. Due to the short duration of an airplane flight, it is not inconvenient for passengers to avoid food. Hence, the airlines can easily avoid this expenditure without any impact on customer satisfaction. This cost-saving mechanism will reflect in lowered flight prices, a move that will be appreciated among all travellers and one that will entice more and more people to fly.
- (D) This statement shall weaken the argument as it discusses other factors that influence air travel.
- (E) This option shall considerably weaken the argument as it states that in-flight food is very important for travellers.

The correct answer is C.

24. Argument Construction:

The statement makes two claims: one, that enhanced exposure to mass media is responsible for an increased awareness amongst people regarding their rights and second, that this has also led people to fight for their rights.

- (A) Option A strengthens this claim by providing data in its support.
- (B) Option B weakens the argument by raising questions on the content showed by the media.

- (C) Option C also presents information that strengthens the argument.
- (D) Correct. Both options A and C strengthen the argument.
- (E) This option weakens the argument.

The correct answer is D.

25. Argument Construction:

Here, the government has decided to deregulate the prices of diesel and petrol. This means that the market forces will control the prices and not the government.

- (A) This statement weakens the argument. If an increase in the prices of fuel will have a negative impact on its consumption, then the move will prove counterproductive.
- (B) Correct. The statement says that this decision has been taken to reduce the losses being faced by fuel companies. Now, this will happen only if the demand for this product is not affected by fluctuations in its price. Hence, even if the prices go up, the government is reasonably sure that the demand will remain unaffected, helping the companies increase their profits. Hence, option B strengthens the argument.
- (C) The primary reason being given for the deregulation is the reduction of losses. A dip in automobile sales might, at best, present a tangential reason.
- (D) Not relevant to the argument.
- (E) This is an unrelated option and can be negated.

The correct answer is B.

26. Argument Construction:

The author claims that the availability of talented candidates for private banks will reduce as annual recruitment is on the up in the public sector banks. That means the author assumes that the talent pool for banking jobs is restricted.

- (A) This option rather weakens the argument by saying that private sector pays more. Had this been true, candidates might have

preferred private over public.

- (B) Correct. If there is a limited resource pool for banking jobs, then the increase in the recruitments being done by public banks will definitely create a paucity of candidates for private sector jobs.
- (C) This option again weakens the argument. If the jobs in public sector are not considered challenging enough, then there might be a disinclination towards them.
- (D) Though this option presents one reason why jobs in public sector banks may be more lucrative for candidates, it addresses only one aspect without focusing on the key issue.
- (E) This is a vague and unrelated argument.

The correct answer is B.

27. Argument Construction:

The author makes an argument in favour of making Hindi the national language of India. The reason he gives for this suggestion is the fact that the government wastes a lot of money in translating official documents into local languages; money that can be utilised elsewhere.

- (A) This statement strengthens the claim of the author by providing data that supports the main argument.
- (B) This option does weaken the argument tangentially – if Hindi is the most spoken language in the country, it does not preclude the fact that there is still a percentage of population that does not speak Hindi. Hence, the government is duty bound to cater to the needs of this segment no matter how small it is.
- (C) This option is beyond the scope of the argument. Whether the people pay taxes or not is not the central point being discussed. The main argument is talking about the utilisation of people's money.
- (D) This option actually strengthens the author's claim. If people travelling across the country manage to learn Hindi within a year, it implies that the language can easily be learned and is spoken in large parts of the country.

- (E) Correct. This option directly contradicts the information given in the main statement – the passage states that Hindi should be made the official language, while the option states that Hindi is already the official language.

The correct answer is E.

28. Argument Construction:

The argument states that scientists in India and other commonwealth countries do not pay attention to the studies done in non-english speaking countries. However, scientific studies are being conducted in other non-english speaking countries as well.

- (A) This option goes beyond the scope of the argument. The passage is specifically talking about ignorance among the scientists of the Commonwealth. We cannot draw generic conclusions based on this.
- (B) Correct. If the scientific breakthroughs being made in the non-english speaking countries are not recognised by scientists in commonwealth countries, then it can be inferred that there will be an overlap between the scientific findings reported in these countries and those published in non-english speaking countries.
- (C) This option weakens the claim made in the passage.
- (D) This is a vague and moralistic argument.
- (E) This statement shall weaken the claim made in the passage.

The correct answer is B.

29. Argument Construction:

This is a sampling assumption. The argument in this passage is that male readership of novels is significantly lower than the female readership (based on surveys in Britain, the United States and Canada), and that if women were to stop reading them, novels would die out.

- (A) This is only a shortcoming of Ian McEwan's impromptu 'survey' (a fact mentioned in the paragraph itself) and not of the whole argument.

- (B) This is a tricky option. Whether or not men read more books than women per capita, the bottom line is that they still form only 20 percent of the market for fiction (in the stated countries, at least), so option B is not a suitable answer.
- (C) The argument is specifically about novels (i.e. non-fiction), so whether or not men read plenty of non-fiction is irrelevant, and option C is incorrect.
- (D) Correct. The argument rests on the assumption that the patterns of reading novels in the three countries cited is representative of a worldwide pattern, but if this is not the case—as stated in option D—then the argument is weakened.
- (E) This is a vague argument that merely presents an opinion.

The correct answer is D.

30. Argument Construction:

The argument in the paragraph is that going to the gym is far too similar to joining a cult in the kind of fanaticism it inspires in its adherents.

- (A) Just stating that *some* people are not fanatical about going to the gym does not change the fact that others *are*. So, option A is incorrect.
- (B) The paragraph is not about the workings of gyms and cults per se, but the feelings they inspire in their members, so option B is slightly tangential to the point.
- (C) Option C indicates that people go to the gym for reasons that include socialising or feeling good about themselves. These are not touted to be fanatical reasons. However, this option does not definitely rule out that the reasons are unbiased and logical. Hence, option C is incorrect.
- (D) Correct. Option D casts doubt on the basic argument, by stating that however fanatical people may be about going to the gym, their fanaticism has a scientific basis, as opposed to the irrational reasons for joining a cult.
- (E) This option actually strengthens the contention made in the passage.

The correct answer is D.

31. Argument Construction:

The paragraph is making a case for the intangible (i.e., non-financial) benefits of hosting high-profile sporting events for the host city or region.

- (A) Correct. Option A presents another intangible benefit of hosting such events – communal harmony and reduced friction amongst the different elements of society. This strengthens the main argument being made by the author.
- (B) Option B weakens the argument as it shows that the benefits are too short-term to be of much worth.
- (C) Option C also weakens the argument as it shows that the intangible benefits may be accompanied by intangible disadvantages, which may outweigh the benefits.
- (D) This option weakens the argument made in the passage.
- (E) This option also weakens the argument made in the passage.

The correct answer is A.

32. Argument Construction:

The basic argument in the paragraph is that the degree of emotional closeness between people is directly proportional to the degree of relatedness between them, as measured by the percentage of genes they share.

- (A) Correct. This option, which shows that twins who share all their genes are emotionally closer than twins who share only half, strengthens this argument.
- (B) Option B is irrelevant as it talks about how alike certain siblings are, which is not an issue in this argument at all.
- (C) Option C is also beyond the scope of the argument due to the reason provided above.
- (D) Option D shows a contrary finding, so it weakens the argument.
- (E) This option also weakens the argument

The correct answer is A.

33. Argument Construction:

The argument essentially draws a parallel between equal opportunity, equal income and economic development. It states that western countries have strived for equal opportunity and have been able to achieve it to a large extent – by having more equitable distribution of wealth. Economists in India are in favour of the equal income model as they believe that it will accelerate economic development.

- (A) This option is logically contradictory – if equal opportunity does result in equal income, then how is it possible that people don't get paid for their efforts.
- (B) The passage is not talking about the utilisation of excess income.
- (C) This option reiterates the main idea and strengthens the argument.
- (D) Correct. Economists in India are in favour of the equal income model as they believe that it will accelerate economic development. However, the ground reality presents a different picture. In developing countries, the gross income of most of the people is so low that if it were distributed equally, no one would save enough to provide resources for investment. This will negate the very rationale behind introducing the equal income model.
- (E) This option is beyond the scope of the argument.

The correct answer is D.

34. Argument Construction:

The argument concludes that the poor performance of the movie can be attributed to the talk show host making fun of it.

- (A) Option A strongly supports the argument.
- (B) Option B is invalid.
- (C) Option C does not specify whether the host is responsible for the poor performance of the movie.

- (D) Correct. Option D reverses this logic by stating that it is because the movie was performing badly that the talk show host was making fun of it. Thus, the talk show host could not be responsible for the failure of the movie.
- (E) Option E can be taken into consideration as it says the movie was criticised by media also but D is the most appropriate option.

The correct answer is D.

35. Argument Construction:

A survey was conducted to know the satisfaction levels among the citizen of a city. Since majority of the respondents said they were satisfied, a conclusion was drawn that the citizens as a whole were satisfies as well.

To weaken the argument, we need to find a flaw in the whole survey.

- (A) Correct. If the sample was taken from only a particular economic stratum, the sample becomes biased. Thus, this option highlights a flaw in the argument.
- (B) Some of the residents may have said they were dissatisfied. Still the argument may be valid that as a whole the citizens are satisfied. It doesn't weaken the argument.
- (C) Comparing the results with the neighbouring cities doesn't impact the argument at all as the argument is about only one city.
- (D) This statement rather strengthens the argument. By stating that the sample was representative of the entire population, we strengthen the argument.
- (E) Mentioning the governing bodies makes the argument out of scope as there is no reference made to them in the question.

The correct answer is A.

36. Argument Construction:

The author states two things that help a person complete a marathon, either practicing for 4 hours or consuming high energy

foods. Out of the two, the author prefers practising over diet. On the basis of his preference he draws a conclusion that if one practises well, one can ensure one is doing the most that can be done to perform well in a marathon.

To weaken this argument we either say that the other alternative is better or this way of preparing oneself is not sufficient or a combination of both of them is even better.

- (A) This option only mentions the opinions of some marathon runners. Thus, it isn't a very plausible option.
- (B) Correct. This option says combining both the methods is even better. So the conclusion is negated.
- (C) This argument is out of scope as mentioning the purpose of participation doesn't relate to the conclusion drawn in the question.
- (D) This option mentions pace but doesn't refer to either of the two alternatives mentioned in the argument. So this is an incorrect option.
- (E) This option can also be eliminated with the same logic that to negate the argument we need to relate the options with at least one of the alternatives. This argument doesn't do that.

The correct answer is B.

37. Argument Construction:

To be able to clear a particular test, a person has to fulfil two criteria. If he isn't able to fulfil any one of them, he wouldn't be able to clear the test. This is followed by the example of Kavita who in any scenario cannot fulfil both the criteria.

- (A) This argument is merely an opinion without any logical backing. We can easily eliminate opinions as incorrect options.
- (B) As the question says, to be able to clear the test one has to fulfil both 15 coaching sessions and 20 practice tests, hence, this option cannot be inferred as it talks about completing only one requirement.
- (C) We cannot be sure if Kavita would retake the test or not. So this is an incorrect option.

- (D) Correct. If under the given circumstances Kavita isn't able to fulfil both the requirements together, it is most likely that she will not be able to clear the exam as to clear it both requirements have to be fulfilled.
- (E) This option can also be eliminated using the same logic used in (B). Only one criterion is fulfilled here.

The correct answer is D.

38. Argument Construction:

The number of tigers throughout the world is declining. To combat this problem, experts argue that the best chances of the survival of tigers are in India.

- (A) Correct. As the question says, conservation is a major concern across the world. Thus, this statement has to be true.
- (B) The question says the best chances of survival of tigers are in India. This doesn't mean they cannot survive anywhere else. So this is an incorrect option.
- (C) We cannot be sure if the Indian government is taking ample of steps or not. May be the government is doing something, still the number is declining because of other reasons.
- (D) 'The chances of the survival of tigers are the best in India' doesn't mean that the existing number of tigers is the highest in India.
- (E) The rate at which the number of tigers is declining cannot be commented upon as it is out of the scope of the argument.

The correct answer is A.

39. Argument Construction:

A city's governing council has spent a lot of money on advertisements on the harmful effects of smoking and these advertisements are targeted towards college students. The authority thinks the number of smokers in college campuses has gone down because of these advertisements.

- (A) Since this statement mentions alcohol it can easily be eliminated as being out of scope.

- (B) The question targets only college goers. Comparing it with non college goers makes this a wrong option.
- (C) This statement talks of the whole city and not college. Since the point of the argument is about colleges, this is a wrong option.
- (D) Correct. The argument assumes that there can be no other reason for the decrease in the number of smokers except the advertisements by the authorities. Option D weakens this by providing an alternative explanation for the drop in the number of smokers within the city—higher cigarettes prices.
- (E) This statement has nothing to do with the argument made by the authority regarding their advertisements. So it is an incorrect option.

The correct answer is D.

40. Argument Construction:

Since the number of badminton racquets being sold in Chennai has tripled in one year, the author draws a conclusion that more and more people have started playing badminton in Chennai. Anything that relates the conclusion to the premise will strengthen the argument.

- (A) If tourists buy these racquets, the number of people playing badminton in Chennai will not increase. This is an incorrect option.
- (B) We cannot comment about the sale of racquets in other cities. Also, this won't impact the conclusion at all.
- (C) Correct. The argument is based on the assumption that most of the badminton racquets sold are actually being used by residents of Chennai.
- (D) There is no reference to cricket bats and golf clubs in the argument. So this option is out of the scope of the argument.
- (E) E actually weakens the argument by suggesting that the increase in sales of badminton racquets may not lead to an increase in the number of residents of Chennai taking up badminton.

The correct answer is C.

41. Argument Construction:

On the basis of an instance where more than a dozen children were attacked by dogs, the author draws a conclusion that dogs shouldn't be kept as pets in neighbourhoods with a large population of children.

- (A) The argument relates dogs to children. Bringing adults and other dogs doesn't impact the argument anyhow. So this is a wrong option.
- (B) Rottweiler is merely an example used to represent dogs as a whole. Giving a specific argument about Rottweiler doesn't impact the argument.
- (C) This statement rather weakens the argument by giving the example of Pugs that are very friendly and can be kept as pets.
- (D) This statement also sort of weakens the argument by stating children should be taught to be safe and keep away from dogs. What is needed in the argument is vice versa.
- (E) Correct. The evidence in the argument mentions Rottweilers but the conclusion is for all dogs in general. Thus, the assumption has to be that Rottweilers are representatives of dogs of all breeds, making E the correct answer.

The correct answer is E.

42. Argument Construction:

Petroleum and its by products are a major source of pollution and their use has increased in cities like Delhi and Mumbai resulting in pollution and health problems.

To weaken the argument, we must show that the use of Petrol and Diesel instead of other sources is actually good for health and not harmful.

- (A) Comparing petrol with diesel doesn't do anything as the argument considers both of them as harmful.
- (B) Correct. This argument says coal and other such sources are more harmful than petrol and diesel. Thus, using petrol and Diesel is justified.

- (C) This might look like strengthening the argument but it merely justifies using petrol and diesel by giving an opinion.
- (D) Solar energy may have limitations but it doesn't justify not using it over pollution creating sources like petrol and diesel.
- (E) This statement is unrelated to the argument as it doesn't refer to petrol or renewable sources of energy.

The correct answer is B.

43. Argument Construction:

India is going to increase its exports of consumer goods to China.

- (A) Correct. Market is what attracts an investor. Therefore, this statement clearly bolsters India's decision.
- (B) This is more a hurdle than an encouragement for the said decision. Therefore, it doesn't strengthen it.
- (C) This statement makes the said decision pointless. Therefore, it doesn't strengthen it.
- (D) This is an additional and unrelated statistical information. It is not related to the main argument.
- (E) This is a discouraging comment on the given situation. Therefore, it actually weakens the decision.

The correct answer is A.

- 44.** (A) This is in line with the decision of the University.
- (B) Correct. This weakens the decision as the option states that the required infrastructure will take 2 years to build. So, an accreditation cannot be obtained in 6 months.
- (C) This is in line with the decision of the University.
- (D) This is in line with the decision of the University.
- (E) This is in line with the decision of the University.

The correct answer is B.

45. Argument Construction:

Tax concessions for small scale industries should be encouraged as they're socially beneficial. Also, the company laws should be flexible for such industries.

- (A) This is beyond the scope of the argument-it neither strengthens nor weakens it.
- (B) Even if this is an outcome of tax rebates and flexible laws, we don't know whether it is a desirable or an undesirable one.
- (C) This statement strengthens the given argument.
- (D) Correct. It weakens the given argument by highlighting how small scale industries bloom into bigger and more profitable firms eventually, even without any such tax rebates.
- (E) This weakens the given argument but in a limited aspect as it only talks "some industries" are subsidiaries of giant ventures.

The correct answer is D.

46. Argument Construction:

The passage states that in order to deal with rebellions, governments should be mindful, tolerant, and open to peaceful negotiation.

- (A) The given argument supports the role of a tolerant, understanding and open government. This has been reiterated in option A which, clearly, strengthens the given argument.
- (B) Option B pertains to the general characteristics of man's nature; a government's approach is not relevant to it.
- (C) Option C refers to the general attitude of authorities towards those who challenge them; but it does not dwell on solving the rebellion. Both options B and C have no impact on the given argument. They neither support nor contradict it.
- (D) Correct. Option D directly contradicts the view presented in the argument. It presents an alternate way of dealing with rebellions, through an iron hand approach, that has been adopted successfully by dictators.
- (E) Option E also strengthens the given argument.

The correct answer is D.

General Solution for Questions 47–48:

Argument Construction:

The author says that the claim people make that a two party system can also be democratic is a farce. To prove it wrong he compares politics to sports and says it is possible only in sports and politics is not a sport.

To strengthen the argument we must favour the author's stance.

To weaken it we must oppose.

- (A) This argument weakens the statement. The author's stance is that two party system isn't conducive to democracy. This option presents facts that directly contradict the author's claim.
- (B) This is merely an opinion. All the opinions are the first options to be removed as wrong as they aren't substantiated.
- (C) The author disagrees with a two party system stating there cannot be democracy in it. This option also points out a flaw in the two party system thus supporting the author.
- (D) Since the argument is about a two party system the correct option also has to revolve around that. Sports is merely an analogy used. So this is a wrong option.
- (E) Although this option supports the stance of the author, it gives only an opinion and doesn't substantiate it with reasoning. We cannot choose it over (C) which gives a valid reason.

47. The correct answer is C.

48. The correct answer is A.

49. Argument Construction:

The argument states that the fact that children find it difficult to digest milk is a reason given by them for not wanting to drink it. We have to find an option that supports or reinforces the claim made by the children.

- (A) This option is wrong as it is an opinion that these are excuses.

- (B) Since the question stem talks about children, an option targeting adults cannot strengthen or weaken the argument in any manner.
- (C) This option also doesn't relate to the argument at all as it presents an opinion that says milk is good but provides no reasoning for the main argument.
- (D) Lack of calcium might have a detrimental impact on the well-being of children but this statement also does not connect with the main contention being made by the author.
- (E) Correct. E addresses the issue of the ability of people in general (including children) to digest milk. If research has proven that lactose intolerance is present in some people, then it is possible that the claim made by the children is correct.

The correct answer is E.

50. Argument Construction:

The passage highlights the importance of geographical factors in the cultural and political unification of a country. It gives the example of China and the role played by the rivers and plains in its cultural evolution.

- (A) This option is beyond the scope of the passage as the issue isn't about industrial vs. agrarian societies at all.
- (B) The main comparison in this paragraph is between China and western Europe, so option B is irrelevant.
- (C) Correct. The main argument in this paragraph is that the geography of a land significantly affects whether or not it can become a politically and culturally united country. However, option C presents other factors that play a critical role in this process. Thus, it weakens the main argument in the passage.
- (D) Option D merely rephrases the conclusion of the paragraph, that is, China is politically and culturally united, whereas western Europe is not.
- (E) This option goes beyond the scope of the passage and presents extraneous information.

The correct answer is C.

2 Deductions

1. **Inference I:** The argument says that disasters such as thunderstorms and cyclones occur during a couple of weeks in hot season. This doesn't mean that the hot season lasts for two weeks. It may last longer. So this is an incorrect inference.

Inference II: Since the inference says 'most' it can be inferred as the disasters occur only during two weeks of the hot season.

The correct answer is B

2. **Inference I:** The author makes a claim that the correlation between incomes and residence in slums is not perfect. To back it up he gives the reason that the people living there may be above the poverty standards but they still choose to live in slums. So we can say that despite being able to afford houses elsewhere, some people still continue to live in slums.

Inference II: This is a very generic statement. We cannot say that poverty lines in general are flawed. May be they are correct and the flaw is somewhere else. So it is an incorrect inference.

The correct answer is A.

3. **Inference I:** The argument is about small South American nations. Any inference drawn about South America in general will be wrong. This inference does that. So it is only a probable inference and not correct.

Inference II: This has to be a correct inference as the argument clearly talks about the state sponsored food security programmes. This certainly means that the small nations invest a part of their revenue on food security. Only then does the claim become possible.

The correct answer is B.

4. **Inference I:** When the author claims that the drop in gold prices is against the usual trend he certainly means that the general belief

was that the gold prices must have increased during this festive season like they normally do. So it is a correct inference.

Inference II: This is the opposite of the claim made by the author. On the contrary, the author says that the increased demand for gold ornaments usually results in an increased demand for gold bars. This clearly shows that both are interlinked. So II cannot be inferred.

The correct answer is A.

5. **Inference I:** This may look like a correct inference but is incorrect because the argument says that programmes for women are often based on topics like recipes and household management but we cannot be sure that women are interested only in such matters. It is a very specific and narrow statement.

Inference II: The claim in the question is confined to recipes and household management. It does not talk about sports. So we cannot infer II.

The correct answer is D.

6. **Inference I:** Since most of the runs were made by all-rounders, we cannot say that more than half of the team consists of all-rounders. May be only 2 players were all-rounders and they made these runs.

Inference II: This inference is out of the scope of the argument as we cannot say if they were spinners or not.

The correct answer is D.

7. **Conclusion I:** Though it is mentioned that the Aluminium manufactured in India is of a much better quality than the aluminium manufactured in other countries across the world, there is no mention of the price or profitability. There might be other factors that influence the decision regarding the sale of the material. Thus, Conclusion I is not valid.

Conclusion II: We have no information regarding the reasons behind the better quality of the aluminium. It might have something to do with the manufacturing process or could be due to other factors

such as the superior ore quality and so on. Thus, Conclusion II is also not valid.

The correct answer is D.

8. **Assumption I:** Extreme words like only and all usually make assumptions wrong. The claim the author makes is about Ravi Sharma's book but we cannot make any assumption about all books. So it is a wrong assumption.

Assumption II: The question states that this book will be his first best seller, this certainly means that he did not have a best seller till date.

The correct answer is B.

9. **Assumption I:** Though, on a quick examination of the argument, there does appear to be a link between the number of hours clocked and the award, no such relation has been established in the argument. The company may grant awards based on several other parameters as well (efficiency, productivity, results and so on). Hence, assumption I is not implicit.

Assumption II: This assumption is vague and makes moralistic judgements.

The correct answer is D.

10. **Assumption I:** A comparison is being drawn between the time taken by two sisters to clean their respective rooms. In order for the comparison to be valid, the parameters have to be the same. In this case, two elements are important – the size of the rooms and the extent of dirtiness. Thus, assumption I becomes implicit in the argument.

Assumption II: This assumption is not only beyond the scope of the argument, but also contradicts the information provided in the statement.

The correct answer is A.

11. **Assumption I:** In this statement, it is apparent that Meena is a qualified teacher with extensive experience. However, we cannot put a value to the qualifier “extremely”. Such words always negate the assumption.

Assumption II: This assumption is implicit in the argument.

The correct answer is B.

12. **Assumption I:** The argument says that advisories have been issued. This doesn't mean that the forecast made by the weather department is accurate. This is a precautionary step that is being suggested in order to preclude the possibility of any damage. This assumption is too extreme.

Assumption II: This also is a wrong assumption as farmers might be taking decisions without the help of the weather department all the time. The forecast made by the department might be just one factor that influences their decision making. The weather department is also merely fulfilling its responsibility and not dictating the decisions of the farmer.

The correct answer is D.

13. The premium has shot up for either one of the reasons. Hence, either assumption is enough to arrive at the conclusion.

The correct answer is C.

14. **Assumption I:** If a particular sop will provide an edge to this party, then it can easily be ascertained that this sop is not provided by any other party.

Assumption II: Also, schemes are introduced to provide benefits to the masses, thereby increasing the popularity of the one who introduces the scheme. Hence, both the assumptions are implicit.

The correct answer is E.

15. **Assumption I:** The statement that “this model will be the highest selling model in the sales history of the company” is based on the data that the company has sold a record 1.3 million sets of the model

in its first week of release. Hence, it is clear that no other phone made by the company has achieved this feat.

Assumption II: Just because this phone is selling well, we cannot make generic assumptions about customer preferences. It is possible that different customers pay attention to different aspects of a phone. Thus, only the first assumption is implicit.

The correct answer is A.

16. The situation defines the plight of rural areas where the food grains being supplied and consumed are impure. This is causing food poisoning.

A correct assumption will be the one on which the whole argument rests upon.

Assumption I: Correct. It can certainly be assumed that impure grains are readily available in the rural areas. Thus, we can also say that there are shops that sell impure grains.

Assumption II: Since there is no data available other than that for rural areas, we cannot say that the percentage of people consuming grains is higher in rural areas.

The correct answer is A.

17. **Assumption I:** is definitely implicit in the statement since it is the most plausible reason for keeping children mentally stimulated.

Assumption II: is not implied since we do not know anything about the prediction of intelligence. Also it has a lot of data that makes it wrong.

The correct answer is A.

18. **Assumption I:** is invalid because we cannot be sure of the effects this step might have. The statement is farfetched.

Assumption II: The laptop company plans to raise the price of its laptops with immediate effect. The company must have assumed that the demand of its laptops wouldn't go down considerably

because if that were the case, it would not have taken the decision to raise the price. So assumption II is valid.

The correct answer is B.

19. **Assumption I:** is not implicit since we have no idea how the bank will respond.

Assumption II: is not implicit because we do not know whether Suresh has approached other people for this loan. He may have finalised taking money from the bank for various reasons; unavailability may be one of the reasons among others.

The correct answer is D.

20. **Assumption I:** Since we do not know how many applicants are there in total, we cannot assume that all the applicants might get selected. Thereby this is not an assumption.

Assumption II: So many applicants would not apply to the said college if the selection process was known to be biased in some way. Thereby this is an assumption.

The correct answer is B.

21. **Assumption I:** The word “better” in the question statement negates this statement. It only states that the people need to find better ways to live life wisely. This does not mean that there are no ways available to them at present.

Assumption II: If people did not have the option of living wisely then the question statement would not be feasible either. Thereby this is an underlying assumption.

The correct answer is B.

22. I. This is an obvious course of action.
- II. When the Government takes such an action it is necessary that people are made aware of the consequences they would face if they do not obey the directive. Hence II follows.

The correct answer is E.

23. I. The intensity of the infection has been the most severe in four years. The epidemic itself is not a four-yearly feature. Hence, precautionary measures should be taken every year and not every four years. Therefore, action I does not follow.
- II. Action II is not a preventive action against conjunctivitis, nor is it feasible. Hence II also does not follow.

The correct answer is D.

24. I. The first course of action is logical and should be followed.
- II. The bank manager has just had a premonition. He should first confirm whether money is actually missing and only then he/she should inform the police for taking action.

The correct answer is A.

25. I. The decision to revise the fee structure for artists should be taken by the channel as a remedy towards the challenging problem that has arisen before it.
- II. However, taking stringent action against people responsible for the programmes that saw a decline in popularity is a negative and reactive step that will cause more damage. In such scenarios, proactive and futuristic decision making is required. So only course I follows.

The correct answer is A.

26. I. Since the enteric fever is a water borne disease, its chief source is drinking water. The first course of action may help contain the infection, as it often spreads through open sources also.
- II. The second course of action II is also required as this particular area has seen the most severe impact of the epidemic. Hence both the actions follow.

The correct answer is E.

27. I. The first course of action is a suitable follow up by the Government as it would deter the defaulting companies.

- II. But the second course of action does not follow as there is no clear and direct link between the lack of welfare measures and decline in the services provided.

The correct answer is A.

28. I. The disease occurs at the end of monsoons every year. So, precautionary measures every four years shall not help.
- II. The second course of action shall be a preventive measure. So, only course II follows.

The correct answer is B.

29. The Chinese present tough competition to the Korean garment export industry that is venturing into Latin American markets. The correct courses of action here will be the ones dealing with the tough competition.
- I. This cannot be a desirable course of action as it is no solution to the problem, simply quitting from the market may save it from the competition but will not be a solution to the problem.
- II. Correct. This can be a desirable course of action as improving quality may make the products more desirable, thus giving the Koreans edge over the competition.

The correct answer is B.

30. The statement says that the imported apples are of a better quality. Thus, to compete against them, Indian apple growers should take steps to improve the quality of their apples.

Course of action I is not correct because a forceful action is always undesirable.

Course of action II is invalid because although this might help the indigenous growers but the core problem of quality will not be catered to.

The correct answer is D.

- 31.** Course of action I doesn't follow because providing a bailout package would be similar to throwing good money after bad. Also if there are no signs of profit anytime soon, putting more money in it will not be feasible.

Course of action II will follow because steps must be taken to try and make the airline profitable by cutting excess expenditure and improving efficiencies. This will deal with the core problem of losses thus solving the problem.

The correct answer is B.

- 32.** I. This option makes sense because if the issue of public discontent is ignored, it could turn into a major crisis situation for the government.
- II. The government is tasked with the responsibility of maintaining law and order. As a result, such a passive approach will prove extremely harmful-both for the government and the community.
- III. This proposed course of action is vague and irrelevant.

The correct answer is A.

- 33.** I. Making fire insurance mandatory will help in better addressing the aftermath of such mishaps. Thereby it is a valid course of action.
- II. A checking of the wiring will surely help detect and prevent fires that could be triggered by electrical sources. Thereby it is a valid course of action.
- III. The argument clearly mentions the slow emergency response time as a critical factor. Hence, working on this is of prime importance in improving our defenses in the current situation. Thereby it is a valid course of action.

The correct answer is D.

- 34.** I. We don't know whether offering discounts will attract more customers to the brand. There is a possibility that the competitors are offering better quality or innovative products. In such a scenario, merely giving discounts will not prove helpful. An action whose outcome is unknown and cannot be predicted is not a desirable course of action.

- II. This is the correct course of action. The company should first study its competition- the products they are offering, the methodologies being adopted by them, the marketing strategies, costing and so on. Only this will help them identify the gaps in their systems and introduce the necessary modifications to keep up with the evolving market. Thus, this option is correct.

The correct answer is B.

35. The statement says that most of the items (but not all items) available at malls are expensive. This means that some of the items available at malls may not be expensive. Thus, statement I is a valid inference. However, statement II is extreme and cannot be inferred. Statement III is slightly tricky. Though the facts state that products available at malls are of a better quality and generally more expensive, the fact that the number of people going to malls has increased tremendously over the past two years does not mean that these people are buying the products; they could be going to malls for other reasons.

The correct answer is A.

36. Statement I cannot be concluded in light of Fact 5 – what if none choose more than one hobby.

Statement II cannot be concluded – even if we look at art, Fact 3 only states that ‘at least’ 50 have chosen art - nowhere does it say, ‘at most’ how many have chose art. Hence, II cannot be concluded. Same calculation applies for creative writing also.

In Statement III, even though the stats of only three hobbies are provided, it cannot be concluded from the given facts that only 3 hobbies are allowed in the school.

Hence, E is correct because none of the statements can be concluded.

The correct answer is E.

37. From the given statements, it can be concluded that A and B are sisters, which means B’s nephew is C. Other statements cannot be necessarily concluded.

The correct answer is B.

38. **Argument I:** Though the first argument appears morally strong, please note that in questions based on reasoning, logic, not emotion or values, should dictate the final decision. Such statements are 'judgements' and not 'arguments'.

Argument II: However, one also has to keep in mind that the decision one makes is ethically sound. Thus, even though the decision might render thousands unemployed, it will be desirable in the larger societal context. Thus, neither arguments are strong.

The correct answer is E.

39. **Argument I:** The state machinery can make provisions for the training/deputation of the required staff or other necessary infrastructure that is needed for any initiative. Thus, claiming paucity of resources as a reason for not doing something makes for a weak argument.

Argument II: Though it is important to have a sense of pride in one's heritage, forcing people to learn the language is no guarantee of the same. Also, a lot of initiatives can be undertaken to promote Tamil that might prove more effective. Therefore, both the arguments are weak.

The correct answer is D.

40. **Argument I:** The author claims that if there is an informal evaluation system, the pressure will be less as compared to regular examinations. This is a desirable action as everyone would want reduced pressure on kids. Thus this is a strong argument.

Argument II: This argument presents a flipside of exams stating that if exams are conducted, a child is prepared to face pressure in future life which is much needed. This also makes a very strong argument.

Argument III: is frivolous in light of the statement being argued. There is no relation between a student's etiquettes and exams. So this is a weak argument.

The correct answer is D.

41. **Argument I:** says that demolition will dissuade such 41 from carrying out such activities. This is certainly a desirable action. Thus it makes a very forceful argument because punishing in this case is a necessity.

Argument II: is weak as though the people living there may not have any place to go, one cannot just allow the illegal construction to continue for the benefit of few people only . It can never be a justification to allowing illegal construction.

The correct answer is A.

42. **Argument I:** says that with the easy availability of consumer loans, the accessibility and purchasing power of the Indian consumer has increased. This argument is always desirable and good for the consumer. Thus, it is a strong argument.

Argument II: also states a very valid point that if the purchasing power of the consumer has increased, the consumer will buy things which he may otherwise won't need, leading to unnecessary spending. Thus, this argument also is strong.

Both the arguments make logically valid points and are strong.

The correct answer is E.

43. **Argument I:** This is a weak argument. If an action is opposed on the ground that it will increase the expenditure of the government, even if the general public is benefitted from the action, it is considered a weak argument.

Argument II: This is a strong argument. Increased foreign interest in the country's education system is a desirable action that will result in enhancement of infrastructure, better facilities, research opportunities and so on. Thus, argument II is strong.

The correct answer is B.

44. **Argument I:** This is a valid argument. Any argument that supports added burden on the general population, either in terms of money or hardship, is usually considered a weak argument. Also, closing a loss-making enterprise is an extreme solution that should be

preceded by measures to revive the business. Thus, argument I is a strong argument.

Argument II: This is also a strong argument as it provides a logical justification for taking the decision and presents an alternative course of action that will prove beneficial for the general population in the long run.

The correct answer is E.

45. I. This statement links death (dangerous consequence) and smoking. Thereby it is a strong argument.
- II. This data attests the perils of smoking by linking it to death, again. Thereby it is a strong argument.
- III. This statement directly links smoking to a life-threatening disease. Thereby it is a strong argument.

The correct answer is E.

3 Analytical Puzzles

1. The final arrangement will look like this:

C F G D H E ↑

All the questions can now be easily answered.

The correct answer is B.

2. Check explanation for Question 1.

The correct answer is A.

3. Check explanation for Question 1.

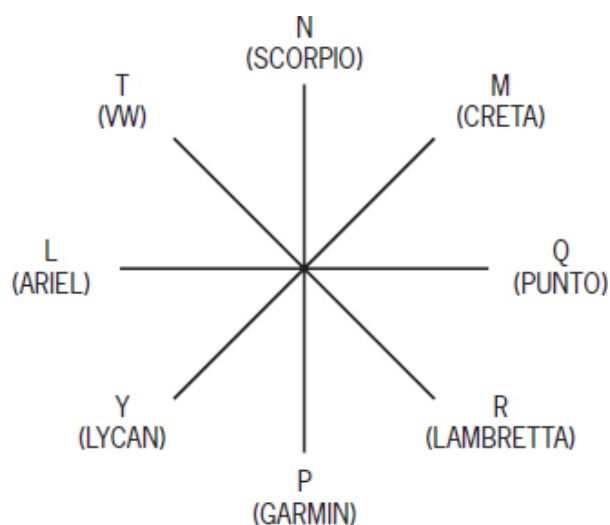
The correct answer is B.

4. All the other pairs have a gap of one place between them.

The correct answer is B.

5. We need to arrange 8 people in a circular arrangement (facing away the Centre). We should start by fixing the position of Y (as a lot of the given information is about Y or related to Y).

The final arrangement will look as follows:



All the questions can now be easily answered.

The correct answer is D.

6. Check explanation for Question 5.

The correct answer is B.

7. Check explanation for Question 5.

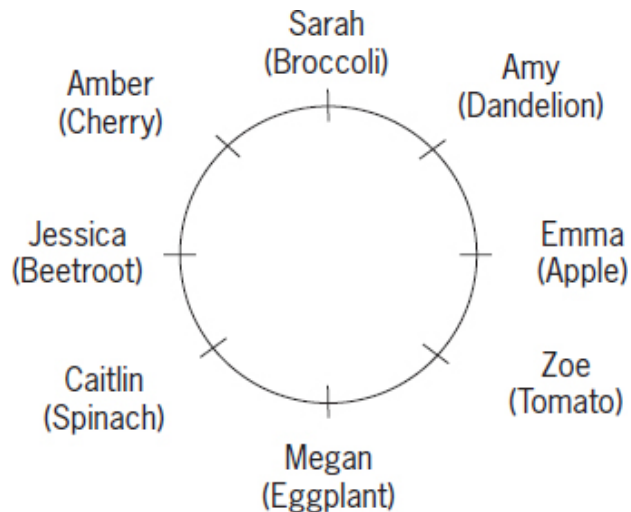
The correct answer is C.

8. Check explanation for Question 5.

The correct answer is C.

9. We have to arrange eight people in a circular arrangement. It is better to start by fixing the position of Caitlin who likes spinach. Now the position of the person who likes apple can be fixed. Similarly, we can fill the other positions.

The final arrangement will look like this:



All the questions can now be easily answered.

The correct answer is C.

10. Check explanation to Q 9.

The correct answer is D.

11. Check explanation to Q 9.

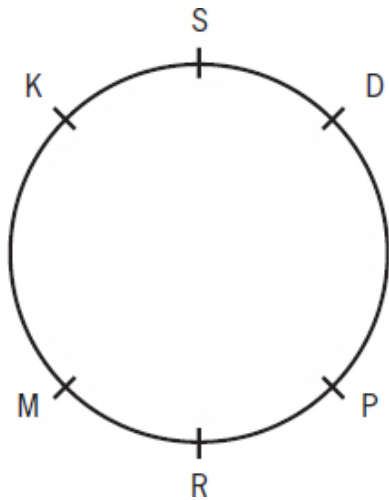
The correct answer is C.

12. Zoe likes tomato.

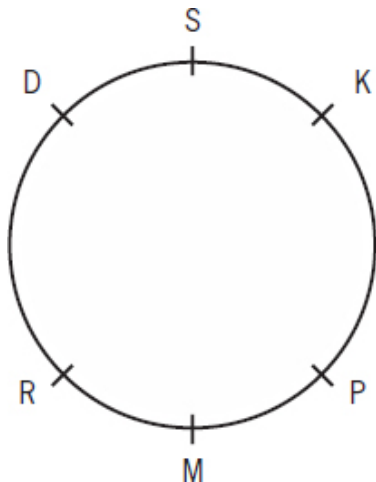
Check explanation to Q 9.

The correct answer is D.

13. The initial arrangement before interchange will look as follows:



Thus, the position after interchange will be as follows:



All the questions can now be easily answered.

The correct answer is B.

14. All other pairs are arranged in an anti-clockwise direction.

The correct answer is D.

15. Check explanation to Q 13.

The correct answer is B.

16. Check explanation to Q 13.

The correct answer is A.

17. The final arrangement will look like this:

Possibility 1

1 (dog)	2 (K-cat)	3 (J-dog)
4 (M-cat)	5 (dog)	6 (H-dog)

Possibility 2

1 (dog)	2 (M-cat/dog)	3 (M-cat/dog)
4 (K-cat)	5 (J-dog)	6 (dog-H)

All the questions can now be easily answered.

The correct answer is E.

18. Check explanation to Q 17.

The correct answer is C.

19. Check explanation to Q 17.

The correct answer is C.

20. Check explanation to Q 17.

The correct answer is E.

21. This is a case of tabular arrangement where we have 4 columns—
Name, City, Area (of job) and Designation.

From 1, we know that Gaurav's designation is Director, the city is Chennai and the Area is Marketing.

From 2, we know that Pratima is in Hyderabad (as she is neither at the Bangalore or the Chennai branch), her area is Accounts and her designation is Manager.

From 3, we don't know the name, but we know there is a person from given 5 who is in Bangalore, his/her designation is Assistant Manager and who works in the Personnel department.

From 4, we know that Sushmita is in Bangalore, her designation is Supervisor and Devanshu is in Chennai.

Putting all this information in table, we get

Name	City (of branch)	Area (department)	Designation
Gaurav	Chennai	Marketing	Director
Pratima	Hyderabad	Accounts	Manager
	Bangalore	Personnel dept.	Assistant Manager
Sushmita	Bangalore		Supervisor
Devanshu	Chennai		

Now, we can complete the table. As we know, there is just one person left whose name is Kuldeep and so he must be the person who is in Bangalore. His designation is Assistant Manager and he works in the Personnel department.

There are two Assistant Managers, one Manager, one Director and one Supervisor. So, Devanshu must be an Assistant Manager.

As we know, among the four who are in Chennai or Bangalore, two are in Marketing, one in the Personnel department and one is in Accounts. We don't know for sure about Sushmita and Devanshu's area, but we know that one of them works for marketing and the other for accounts.

Now the solution table can be completed as follows:

Name	City (of branch)	Area (department)	Designation
Gaurav	Chennai	Marketing	Director
Pratima	Hyderabad	Accounts	Manager
Kuldeep	Bangalore	Personnel dept.	Assistant Manager
Sushmita	Bangalore	Accounts/marketing	Supervisor
Devanshu	Chennai	Accounts/marketing	Assistant Manager

The answer to the question is clearly Kuldeep, that is, option (B).

The correct answer is B.

22. The answer can be clearly seen in the table we made for Q 21.

The correct answer is A.

23. The answer can be clearly seen in the table we made for Q 21.

The correct answer is B.

24. The answer can be clearly seen in the table we made for Q 21.

The correct answer is E.

25. The final arrangement will look like this:

Floor	Person	Car colour
9	Emmanuel	Blue
8	Shane	Black
7	Ethan	Green
6	Richard	Yellow
5	Jason	Red
4	Andre	Orange
3	Joshua	Pink
2	Patrick	White
1	Luke	Grey

The correct answer is E.

26. Check explanation to Q 25.

The correct answer is A.

27. Check explanation to Q 25.

The correct answer is C.

28. Check explanation to Q 25.

The correct answer is D.

29. We have to arrange 7 people on the basis of their course, name and musical instrument and so we need a table with 3 columns and 7 rows. We can fill data for M and R. Now, P must be doing B.Sc as he is doing the same course as R. Similarly, T is doing B.A. So, J, V and W are doing B.Com. Similarly, other points can also be analysed and filled in the table.

The final arrangement will look as follows:

Person	Course	Instrument
J	B.Com	Guitar
V	B.Com	Flute
W	B.Com	Saxophone
M	B.A.	Banjo
T	B.A.	Sitar
R	B.Sc.	Tabla
P	B.Sc.	Violin

The questions can now be easily answered.

The correct answer is A.

30. Check explanation for Q 29.

The correct answer is D.

31. Check explanation for Q 29.

The correct answer is C.

32. Check explanation for Q 29.

The correct answer is E.

32. From option (A) 76, 85, 79, 68, 78 = NOISS

From option (B) 40, 66, 87, 79, 96 = NOIIS

From option (C) 10, 24, 30, 44, 01 = NNESE

From option (D) 40, 85, 79, 96, 77 = NOISE

The correct answer is D.

34. From option (A) 01, 23, 20, 41 = FFAT

From option (B) 43, 40, 78, 98 = FASU

From option (C) 23, 20, 69, 42 = FASL

From option (D) 01, 34, 69, 41 = FAST

The correct answer is D.

35. From option (A) 33, 42, 59, 97 = LLOO

From option (B) 13, 68, 20, 31 = LEAN

From option (C) 42, 97, 20, 34 = LOAA

From option (D) 00, 85, 88, 99 = LOAA

The correct answer is B.

General Solution for Questions 36–39:

Trees have their heights in increasing order and B is in the middle.

Tree A is 3 feet taller than tree D which means A and D have two trees in between. Therefore, it can be concluded that D is shorter than B and A is taller than B.

Difference between tree B and tree F, F being shorter is same as the difference between tree C and tree D, tree C being taller which means B can be 1 foot, 2 feet or 3 feet taller than tree F.

If tree B is 3 feet taller than tree F, then, tree C will also be 3 feet taller than tree D but tree A is 3 feet taller than tree D, so this case is not possible.

If tree B is 1 foot taller than tree F than tree C will also be 1 foot taller than tree D. Therefore, F will have to be the third smallest and tree D has to be the second smallest tree which further contradicts difference between tree A and tree D. So, this is also not possible.

We are left with only one possibility of F being 2 feet shorter than tree B. Also, tree D is shorter than tree B but not the smallest, so tree D will be the third smallest tree.

F D B C A

F is shorter than tree G which means tree G is tallest. So, the final arrangement will be as below:

E F D B C A G

- 36.** Difference of height of tree E and tree B = 3 feet

Tree which is 3 feet taller than tree D = tree A

The correct answer is A.

- 37.** Difference of height of tree G and tree D = 4 feet

4 feet = 4×12 inches = 48 inches

The correct answer is C.

- 38.** Sum of heights of tree G and tree F cannot be determined as there is no evidence of actual height of any tree but only relative position of trees is given.

The correct answer is D.

- 39.** Maximum possible height of tree A = 9 feet

Least possible height of tree F = 2 feet

So, required difference = $9 - 2 = 7$ feet

The correct answer is C.

40. Interchanging '/' and '–', the equation becomes;

$$8 + 7 \times 6 - 16 / 8 = 48$$

$$48 = 48 \text{ (LHS = RHS)}$$

The correct answer is B.

41. Changing the correct signs, the equation becomes:

$$40 + 16 - 16 \div 8 \times 10 = ?$$

$$\text{or, } 56 - 20 = ?$$

$$\text{or, } ? = 36$$

The correct answer is D.

42. Checking through options, we get:

From option (A)

$$16 \times 8 + 2 \div 3 - 4$$

$$= 128 + \frac{2}{3} - 4$$

$$= 124 + \frac{2}{3} = \frac{372 + 2}{3} = \frac{374}{3}$$

From option (B)

$$16 \times 8 \div 2 + 3 - 4$$

$$= 16 \times 4 + 3 - 4$$

$$= 64 + 3 - 4$$

$$= 63$$

From option (C)

$$16 - 8 \div 2 + 3 \times 4$$

$$= 16 - 4 + 12$$

$$= 12 + 12$$

$$= 24$$

From option (D)

$$16 - 8 \div 2 \times 3 + 4$$

$$\begin{aligned}
 &= 16 - 4 \times 3 + 4 \\
 &= 16 - 12 + 4 \\
 &= 20 - 12 = 8
 \end{aligned}$$

The correct answer is D.

43. From option (A)

$$20 + 25 \div 15 \times 4 - 6 = 10$$

After changing sign,

$$20 \div 25 - 15 + 4 \times 6$$

$$= \frac{4}{5} - 15 + 24$$

$$= \frac{4}{5} + 9 = \frac{49}{5}$$

From option (B)

$$20 - 5 \times 10 \div 20 + 4 = 20$$

After changing sign,

$$20 \times 5 + 10 - 20 \div 4$$

$$= 100 + 10 - 5$$

$$= 100 + 5 = 105$$

From option (C)

$$50 + 10 - 5 \div 5 \times 20$$

After changing sign,

$$50 \div 10 \times 5 - 5 + 20$$

$$= 5 \times 5 - 5 + 20$$

$$= 25 - 5 + 20 = 40$$

From option (D)

$$15 - 5 \times 50 + 25 \div 10$$

After changing sign.

$$15 \times 5 + 50 \div 25 - 10$$

$$= 15 \times 5 + 2 - 10$$

$$= 77 - 10 = 67$$

The correct answer is C.

44. After changing signs, the given expression becomes

$$16 \times 5 - 9 \div 3 + 20$$

$$= 16 \times 5 - 3 + 20$$

$$= 80 - 3 + 20 = 97$$

The correct answer is D.

45. $16 \div 4 = 144 \Rightarrow 16 - 4 = 12 \Rightarrow 12^2 = 144$

$$15 \div 3 = 144 \Rightarrow 15 - 3 = 12 \Rightarrow 12^2 = 144$$

$$10 \div 2 = 64 \Rightarrow 10 - 2 = 8 \Rightarrow 8^2 = 64$$

$$20 \div 5 = ? \Rightarrow 20 - 5 = 15 \Rightarrow 15^2 = 225$$

The correct answer is D.

46. In the given example, note that in every step, the words get arranged alphabetically from left to right and the numbers get arranged in descending order. The words and numbers also alternate with the numbers occupying the first slot. Using this logic:

Input: can axe 32 12 kit 57 bat 89

Step 1: 89 can axe 32 12 kit 57 bat

Step 2: 89 axe can 32 12 kit 57 bat

Step 3: 89 axe 57 can 32 12 kit bat

The correct answer is D.

47. Input: 76 cot 64 dog 45 hen 54 urn

Next Step: 76 cot 64 dog 54 hen 45 urn

Next + 1 step: 76 cot 64 dog 54 hen 45 urn

Thus, 2 more steps are needed to complete the arrangement

The correct answer is B.

48. Note that we can never arrive at an input from a given output because there exist multiple possibilities for the input.

The correct answer is E.

49. Note that to get the last step, that is the final output, we don't need to go through all the steps. We can simply arrange the given terms in alphabetical order (for the words) and descending order (for the numbers) – 99 jut 56 mat 33 pot 22 tie.

The correct answer is D.

50. The words are being arranged in increasing alphabetical order, one at a time, and simultaneously, the numbers are being pushed to the end, in increasing order, one at a time.

Input: 29, zoo, 36, yeast, 9, prices, 16, manoeuvre, toxicity

Step I: manoeuvre, 29, zoo, 36, yeast, prices, 16, toxicity, 9

Step II: manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 9, 16

Step III: manoeuvre, prices, toxicity, zoo, 36, yeast, 9, 16, 29

Step IV: manoeuvre, prices, toxicity, yeast, zoo, 9, 16, 29, 36

The correct answer is B.

51. From the explanation provided in Q. 50, the answer can be easily arrived at as B.

The correct answer is B.

52. From the explanation for Q. 50, the answer can be easily arrived at as B.

The correct answer is B.

53. From the table we made for Q. 50, the answer can be easily arrived at as E.

The correct answer is E.

General Solution for Questions 54–57:

The arrangement of output sequence as follow:

In step I, we first shifted smallest word (number of alphabets in word) to the leftmost side and the largest number to the

rightmost side. In step II, second smallest word is shifted to the right of the smallest word and the second largest number is shifted to the right of the largest number. And so on in next step.

Step would procedures doctors 50 operation 75 45 American
I: review 80

Step would review procedures doctors 50 operation 45 Ame
II: 80 75

Step would review doctors procedures operation 45 America
III: 75 50

Step would review doctors American procedures operation &
IV: 50 45

Step would review doctors American operation procedures &
V: 50 45

54. Looking at step V, we find that 'American' is fourth from the left.

The correct answer is B.

55. There are total five steps required to complete the arrangement.

The correct answer is C.

56. In step III 'doctors' is the third element from the left end and '80' is the third element from the right end.

Similarly, 'review' is the second element from the left end and '75' is the second element from the right end.

Now, as 'would' is the first element from the left end, so it will be related to the first element which is from the right end, that is, '50'.

The correct answer is C.

57. Looking at the step IV, we find that there are three words/numbers which are between 'procedures' and '50'.

The correct answer is A.

58. Step 1 = Sum of digits

Step 2 = Letter positions repeated

Step 3 = Input – S1

Step 4 = Add the squares of each digit in the number of Step 3

Step 5 = The alphabet (go around again after count of 26)

Step 6 = Balance of number of letters to reach Z

The fourth element is 1111

Step 1 = 4

Step 2 = DD

Step 3 = 1107

The correct answer is B.

59. The given input is

New Input	1203	3211	4522	1111	6666

For the new input:

Step 1 = 6 7 13 4 24

Step 2 = FF GG MM DD XX

Step 3 = 1197 3204 4509 1107 6642

Step 4 = 132 29 122 51 92

Step 5 = B C R Y N

Step 6 = 24 23 8 1 12

The correct answer is E.

Alternatively,

Step 1 is sum of digits, none of which is 29. Step 2 is alphabets, and so cannot be 29.

Step 3 will be 4-digit numbers, and so cannot be 29. The only possibility is in step 4, and so the only option is (E).

60. For the new input '3210':

Step 1 = 6

Step 2 = FF

Step 3 = 3204

Step 4 = 29

Step 5 = C

The correct answer is B.

61. For the new input '3021, 1123, 2254, 2222, 5555':

Step 1 = 6 7 13 8 20

Step 2 = FF GG NN HH TT

Step 3 = 3015 1116 2241 2214 5535

Step 4 = 35 39 25 25 84

The correct answer is D.

General Solution for Questions 62–65:

The logics used in steps are as below:

Step I: Square root of input

Step II: $\text{Step I} \times 3 + 2$

Step III: $\text{Step I} + \text{Step II}$

Step IV: $\text{Step III} \times 2 + 2$

Step V: $\text{Step I} + 2$

62. Given,

Input = 64

Step I: Square root of input = Square root of 64 = 8

Step V: $\text{Step I} + 2 = 8 + 2 = 10$

The correct answer is E.

63. Given,

Output in Step V = 15

Step I = $\text{Step V} - 2 = 15 - 2 = 13$

Input = Square of step I = $13^2 = 169$

The correct answer is E.

64. Given,

Output in step V = 13, 15, 16, 17, 18, 19

Step I = $\text{Step V} - 2 = 11, 13, 14, 15, 16, 17$

Input = Square of step I

$$= 11^2, 13^2, 14^2, 15^2, 16^2, 17^2$$

$$= 121, 169, 196, 225, 256, 289$$

The correct answer is E.

65. Correct Step II = 8, 14, 26, 32, 38, 44

$$\text{Step I} = \frac{(\text{Step II} - 2)}{3}$$

$$= \frac{(8-2)}{3}, \frac{(14-2)}{3}, \frac{(26-2)}{3}, \frac{(32-2)}{3}, \frac{(38-2)}{3}, \frac{(44-2)}{3}$$

$$2, 4, 8, 10, 12, 14$$

Input = Square of step I

$$= 2^2, 4^2, 8^2, 10^2, 12^2, 14^2$$

$$= 4, 16, 64, 100, 144, 196$$

The correct answer is D.

4 Other Reasoning

1. For column 1: $52 + 32 - 22 = 30$

For column 2: $62 + 42 - 32 = 43$

For column 3: $62 + 42 - 12 = 51$

Similarly, for column 4: $72 + 52 - 22 = 70$

The correct answer is E.

2. $1^2 + 5 = 6$

$2^2 + 5 = 9$

$3^2 + 5 = 14$

$4^2 + 5 = 21$

$5^2 + 5 = 30$

Therefore, $6^2 + 5 = 41$

The correct answer is C.

3. $1^2 + 2^2 = 5$

$3^2 + 4^2 = 25$

$5^2 + 6^2 = 61$

$7^2 + 8^2 = 113$

$9^2 + 10^2 = 181$

The correct answer is D.

4. In figure 1

Sum of the first row = $4 + 3 = 7$

Sum of the second row = $2 + 5 = 7$

$$\text{Sum of the first column} = 4 + 2 = 6$$

$$\text{Sum of the second column} = 3 + 5 = 8$$

$$\text{Sum of the first diagonal} = 4 + 5 = 9$$

Now, in figure 2

Let the first row and second column element be y , and second row and second column element be z .

$$\text{Sum of the first row} = x + y = 15 \quad (1)$$

$$\text{Sum of the second row} = 2 + z = 5$$

$$\Rightarrow z = 3 \quad (2)$$

$$\text{Sum of the second column} = y + z = 10$$

$$\Rightarrow y = 10 - z$$

$$\Rightarrow y = 10 - 3$$

$$\Rightarrow y = 7 \quad (3)$$

From Eq. (1) and (3), we get

$$x + y = 15$$

$$\Rightarrow x = 15 - y$$

$$\Rightarrow x = 15 - 7$$

$$\Rightarrow x = 8$$

The correct answer is B.

5. The pattern followed is as below:

$$5 \times 6 \times 7 + 8 = 218$$

$$7 \times 8 \times 9 + 10 = 514$$

Similarly,

$$2 \times 14 \times 11 + 16 = 324$$

The correct answer is D.

6. The sum of the values in each row is 50.

So, X is 7 and Y is 9.

$$7 + 9 = 16$$

The correct answer is C.

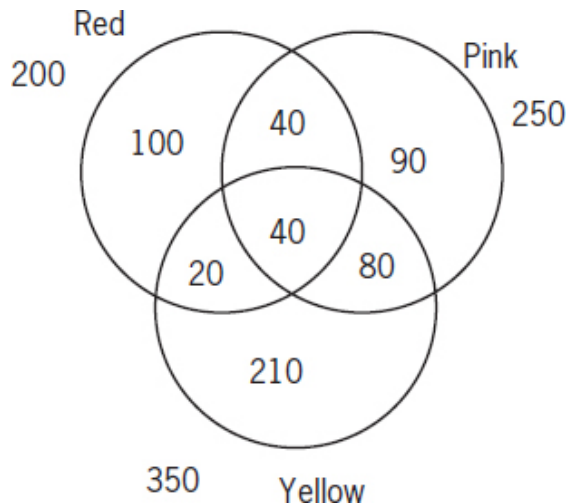
General Solution for Questions 7–9:

$$n(R \cup P \cup Y) = n(R) + n(P) + n(Y) - [n(R \cap P) + n(P \cap Y) + n(R \cap Y)] + n(R \cap P \cap Y)$$

$$\Rightarrow 580 = 200 + 250 + 350 - (80 + 120 + 60) + x$$

$$\Rightarrow x = 40$$

We can draw the following Venn diagram.



7. The number of people who like only Red is 100.

The correct answer is E.

8. The number of people who like only Pink is 90.

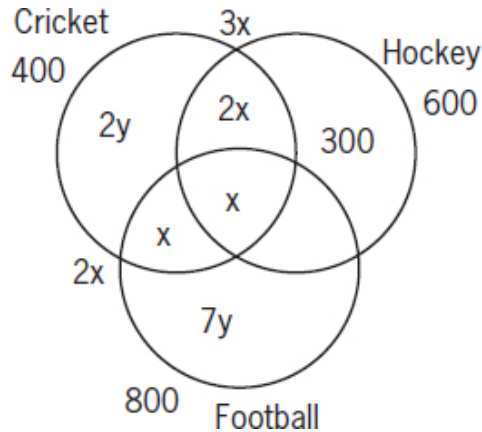
The correct answer is D.

9. The number of people who like only Yellow and all 3 = $40 + 210 = 250$

The correct answer is E.

General Solution for Questions 10–13:

On the basis of the information given, we can draw the following Venn diagram.



If x is the number of players who play all three games, then number of players who play Cricket and Hockey is $3x$ and therefore those who play only Cricket and Hockey is $2x$. Similarly, number of players playing Cricket and Football is $2x$ and so those who play only Cricket and Football is x .

Also, if $2y$ play only Cricket, $7y$ play only Football.

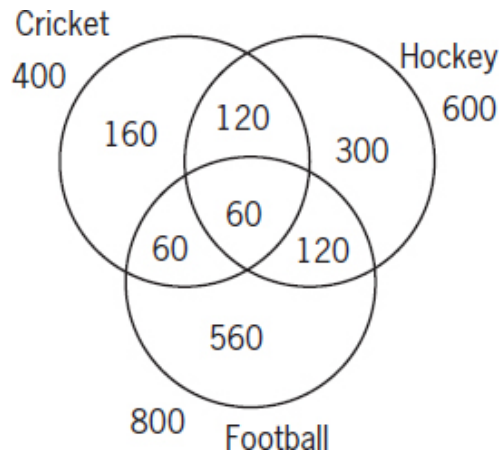
Now, $2y + 2x + x + x = 400$ or $y + 2x = 200$, and

Number of players playing only Hockey and Football = $(800 - 7y - x - x)$ which is same as $(600 - 300 - 2x - x)$.

So, $800 - 7y - x - x = 600 - 300 - 2x - x$ or $-7y + x = -500$.

Solving, we get $x = 60$, $y = 80$.

The revised Venn diagram will be



10. The number of players who play Cricket and Football = $60 + 60 = 120$

The correct answer is E.

11. The number of players who play Cricket and Hockey = $60 + 120 = 180$

$$20\% \text{ of } 180 = 36$$

The correct answer is E.

12. The number of players who play Hockey and Football = $60 + 120 = 180$

The correct answer is C.

13. The required difference = $300 - 60 = 240$

The correct answer is B.

14. 10% who can repair all 3 = $10\% \text{ of } 140 = 14$

Those who can repair exactly 2 = 50 (given)

Number of those who can repair only ACs and only Refrigerators = x
 $+ x = 2x$

$$140 - (22 + 50 + 14) = 2x$$

$$\text{or } x = 27$$

The correct answer is D.

15. Total number of student = 150

Number of student who passed PPT
= 50% of 150 = 75

Number of student who passed PMT = 55

Number of student who passed all the three tests
= 6

Out of these 75 students who passed PPT, 62 students passed only PPT test and 6 students passed all 3 tests.

So, remaining number of students

$$= 75 - 62 - 6 = 7 \text{ students}$$

Out of these 7 students, 4 students didn't pass PMT but passed other two tests.

So, there will be 3 students who didn't pass PET but passed other two tests.

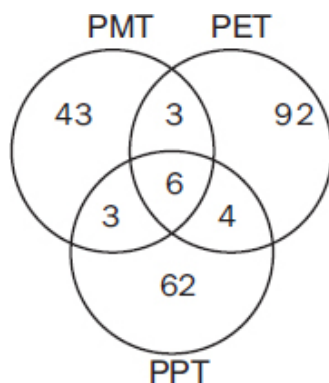
Out of 55 students who passed PMT, 43 students passed only PMT test and 6 students passed all 3 tests.

So, remaining number of students

$$= 55 - 43 - 6 = 6 \text{ students}$$

Out of these 6 students, 3 students didn't pass PET but passed other 2 tests.

Above information can be shown using Venn diagram as below:



So, the number of student who didn't pass PPT but other two tests =
 $6 - 3 = 3$ students

So, number of students passing both PMT and PET
 $= 3 + 6 = 9$

But, 9 is not in the given options. So, as per the given options, we should calculate the number of student who didn't pass PPT but passed both PMT and PET.

From the above Venn diagram, there are 3 students who didn't pass PPT but passed both PMT and PET.

The correct answer is E.

16. Since $\frac{3}{4}$ of the chocolates have nuts and $\frac{1}{3}$ of the chocolates have both nuts and fruits, we can simply subtract $\frac{3}{4} - \frac{1}{3}$ to get all the chocolates with nuts but no fruit.

$$\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$$

The correct answer is B.

17. Number of girls with mobile phones = $\left(\frac{2}{5+2}\right) \times 35 = 10$

$$\text{Total number of boys} = \frac{3}{5} \times 100 = 60$$

$$\text{So, total number of girls} = 100 - 60 = 40$$

Therefore, the required percentage

$$= \frac{10}{40} \times 100 = 25\%$$

The correct answer is C.

18. If x students like both the subjects, then number of students who like only Chemistry is $(45 - x)$ and the number of students who like only Physics is $(60 - x)$.

$$\text{Hence, } (45 - x) + (60 - x) + x + 5 = 100$$

$$\Rightarrow 110 - x = 100$$

$$\Rightarrow x = 10$$

The correct answer is C.

- 19.** Students studying all the three subjects

$$= 500 - (285 + 195 + 115 - 45 - 70 - 50) - 50$$

$$= 20$$

The correct answer is D.

- 20.** It is not given that all of them study at least one subject.

The correct answer is E.

- 21. Argument Construction:**

A certain spate of ragging incidents in medical colleges and the resulting suicides has given rise to a demand for government intervention.

- (A) The incidents of ragging have led to suicides among the students. Clearly, the positive intent behind ragging-building a bond between senior and junior students-has been defeated. Therefore, government intervention is definitely required.
- (B) Correct. This is the appropriate decision as it addresses the problem proactively and defines a clear course of action.
- (C) This statement trivialises an extremely important and relevant issue and absolves the government of all responsibility.
- (D) Though an inquiry should be conducted, shutting down the medical colleges is an extreme decision that will create additional problems.
- (E) Prima Facie, the statement appears correct. Issues such as ragging are the responsibility of college authorities. However, one has to keep in mind that the ragging incidents have led to an increase in the number of suicides. This makes the matter extremely grave and demands stronger action.

The correct answer is B.

22. Argument Construction:

There is a huge amount of garbage dumped on the northern side of Mount Everest. The best option will be the one that presents an effective resolution of the problem.

- (A) the climbers to climb from the southern side is not a solution to the problem as they would then litter the southern side.
- (B) Banning climbing completely is also not a practical solution to the problem.
- (C) This option also can be eliminated as suspending climbing activities will also not present a resolution of the problem. Also, the garbage is largely human generated and the mountain cannot be expected to recuperate on its own.
- (D) Correct. This option is correct as it not only presents an effective resolution of the problem but also includes measures for avoiding it in the future.
- (E) This option doesn't take any decision. It adopts a philosophical and passive approach.

The correct answer is D.

23. Argument Construction:

There have been several incidents in which many doctors have recommended medicines manufactured by those companies that offer huge commissions to these doctors which has resulted in patients being forced to buy medicines at higher costs.

- (A) Though this option appears correct, a question that arises is-how does the council expect to enforce the ban? How will it identify the erring doctors and track these payments? One should keep in mind that a decision is considered a sound one only when it results in the achievement of the desired objective. Thus, this option is incorrect.
- (B) This is a morally and ethically incorrect statement. The primary role of a doctor is to save the lives of his/her patients in the most effective and efficient manner. This makes no allowance for generating extra income.

- (C) The issue being discussed is not that of the impact of these medicines. The central concern is the inflated cost being borne by the patients due to this practice.
- (D) There is no relationship between the cost and the effectiveness of these medicines. Nowhere does the passage state that these medicines are more effective than other medicines.
- (E) Correct. This is the appropriate decision as asking doctors to prescribe only those medicines that are locally available will ensure control over the recommending power of the doctors. Also, if the medicines are locally available the patients can compare prices and buy the ones that meet their budgets.

The correct answer is E.

24. Argument Construction:

A certain spate of closedown of startups is causing losses to both the government and the entrepreneurs.

- (A) The government cannot make such a demand without fully analyzing its repercussions.
- (B) This is an ideal course of action as it will both help in understanding the root of the problem and help figure a way to address it effectively.
- (C) This is a situation that requires a practical approach rather than an idealistic one.
- (D) This cannot be enacted as it could lead to other newer problems.
- (E) This is a defeatist hence an incorrect course of action.

The right answer is option B.

25. Argument Construction:

A replacement of a team leader is needed. The things that need to be kept in mind are: the project is midway, time is important, the team is edgy because of pressure.

The best option will be the one that deals with the above mentioned problems.

From the scenario, it is clear that with edgy high performing individuals and a client who is eagerly waiting for deliveries, there is going to be high level of engagement with the team and the client - hence, a person with good people skills would be required.

- (A) This option can be eliminated as we need somebody with good people skills.
- (B) Correct. Since the team and client both are edgy, we choose a person who can handle both of them well.
- (C) This option also can be eliminated as we need a person with people skills. Also, this option is based on an assumption that someone else might leave as well.
- (D) This option gives no reason why to choose whom. It merely gives an opinion. So this is wrong.
- (E) This option doesn't take any decision. It just involves the HR which in any case would be done.

The correct answer is B.

26. Given that there are five stations and Q is in the middle, that is, Q is the third station.

Q is on the immediate left of R. So, R is the fourth station.

S is not the first station but towards the left of Q. So, S is the second station.

T is towards the right of S, So T is the fifth station. Hence, P will be the first station.

The final arrangement will be as below:

P S Q R T

Hence, station P is to the immediate left of S.

The correct answer is A.

27. 4th element from left → 6

10th element to the right of 6 → D

So, 5th element to the left of D $\rightarrow$ L

The correct answer is D.

General Solution for Questions 28–31: The only possible seating arrangement is:

S is 2nd to the right of P. So, S is either at 3rd, 4th or 5th place. If S is at 4th place, then P will be at 2nd place, in which case T would have to be neighbour of P or S, which is not allowed. If S is at 5th place, then P will be at 3rd place, and T also has to be at 3rd place because there is one person between S and T. Therefore, the only place for P and S is 1st and 3rd place.

Since B is at its leftmost place, B will be facing T. D cannot be with B and D has to face R, so the only place for D is 2nd position and so R is also at corresponding 2nd place. Since C and E are together, they will come between B and D and A will be facing P, at 1st position. Finally, since E does not face S, E will face Q and so C will face S.

On the basis of above, the following arrangement can be made:

Facing South	A	D	C	E	B
Facing North	P	R	S	Q	T

28. From the above table, the persons are P and T.

The correct answer is C.

29. E is facing Q.

The correct answer is E.

30. C is sitting at the centre of the row.

The correct answer is C.

31. R is third to the left of T.

The correct answer is B.

General Solution for Questions 32–34:

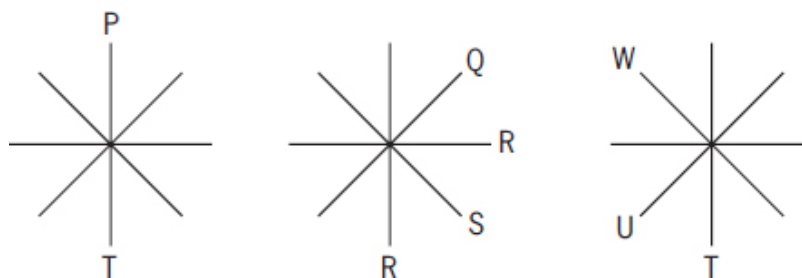
In questions where some are facing the Centre and some are facing outside, it is better to draw a table to keep track of all those facing outside and those facing centre. Make preliminary entries by scanning through the data given. The following is the preliminary table.

Facing outside	Facing the Centre
T	S
U	

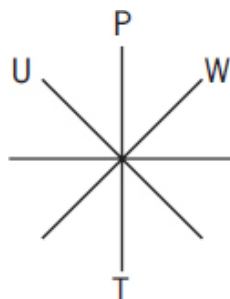
Beginning with the other data, we have

- P is opposite to T.
- S is adjacent to R.
- Q is second to the right of S.
- W is second to the right of U.

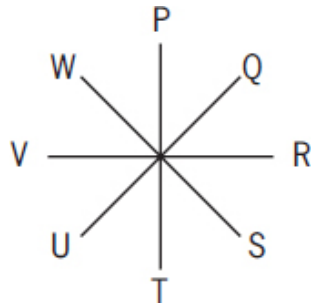
We get the following possible arrangements



If P is facing the centre, we have

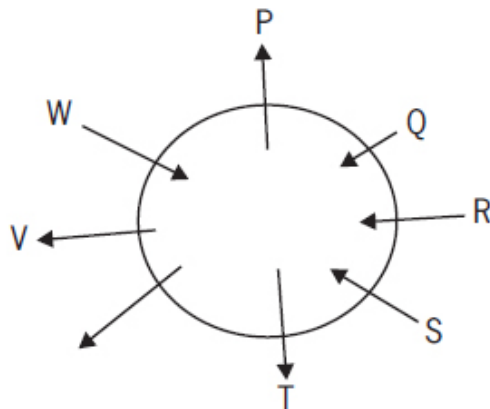


This violates the fact that both neighbours of U face outside. So P faces outside. Now the arrangement is:



The updated table would be:

Facing outside	Facing the Centre
T	S
U	R
P	S
V	W



32. As W is facing centre, so Q is second to the left of W.

The correct answer is C.

33. From both the sides, there are three people between them.

The correct answer is D.

34. P, T, U and V are facing outside.

The correct answer is E.

General Solution for Questions 35–38:

- From statement I and II, Bimal cannot live at floor number 1. Because Geeta lives below the floor number of Bimal.
- From the statement “the sum of the floor numbers on which Aman and Bimal stay is 8”.

$$\text{Aman} + \text{Bimal} = 8$$

If Bimal's floor number is 3, then the Aman's floor number is 5. Then Disha lives on floor number 4 from statement I. Last statement says that full stay just above the floor number of disha which is not possible.

If Bimal's floor number is 5, then Aman's floor number is 3. We can get the following arrangement.

Floor Number	Person
7	Fulla
6	Disha
5	Bimal
4	Chandu
3	Aman
2	Geeta
1	Esha

35. Looking the above table, we get that Esha stays on floor numbered 1 and Chandu stays on floor numbered 4. Therefore, the sum of their floor numbers is 5.

The correct answer is B.

36. Looking at the above table, we find that there are three persons who stay between Geeta and Disha.

The correct answer is C.

37. Esha stays on the floor numbered 1. Therefore, the square of 1 is 1.

The correct answer is A.

38. Looking at the above table, we find that Aman stays just above the floor on which Geeta stays.

The correct answer is B.

General Solution for Questions 39–43:

$$E > A > G$$

$$E > B > C > F$$

Moreover, C got 70%, and so B got 80% and F got 60%. Also, E got 90%.

Using the above information, we get:

$$E (90\%) > B (80\%) > A > C (70\%) > G > F (60\%) > D$$

39. D scored the lowest marks.

The correct answer is B.

40. The marks of D is between 50% and 60% because the lowest marks possible is 50%.

The correct answer is C.

41. The marks scored by G lies between 60% and 70%.

The correct answer is B.

42. B scored the second highest marks.

The correct answer is B.

43. The pairs of letter are ST and RS, so the answer is 2.

The correct answer is C.

44. The question means that we need to find the number of pairs of letters from this word for which there are as many letters between them in the given word as there are letters between them in the sequence of letters (from A to Z).

For example, we know that 'f' follows 'e' in the of alphabet and in the given word too 'f' follows 'e'. We have to count all such cases in the word 'defamation'. We are not given any direction for the given condition and so the letters can be related in a letter forward or backward manner.

These word pairs are as follows:

- (A) d,e—as there is no letter between them in this word and same in actual sequence of letters.
- (B) d,f—as there is 1 letter between them in this word and same in actual sequence of letters.
- (C) d,a—as there are 2 letters between them in this word and same in actual sequence of letters. However the direction is reverse in this word.
- (D) e,f—as there is no letter between them in this word and same in actual sequence of letters.
- (E) e,a—as there are 3 letters between them in this word and same in actual sequence of letters. However the direction is again reverse.

The correct answer is E.

45.

A1	B2	C3	D4	E5	F6	G7	H8	I9	J10	K11	L12	M13
Z26	Y25	X24	W23	V22	U21	T20	S19	R18	Q17	P16	O15	N14

The opposite of B is Y, D is W, F is U and H is S.

Similarly, the opposite of E is V, G is T, I is R and J is Q.

So correct Answer is B.

46.

A1	B2	C3	D4	E5	F6	G7	H8	I9	J10	K11	L12	M13
Z26	Y25	X24	W23	V22	U21	T20	S19	R18	Q17	P16	O15	N14

$A + 2 = C$, $C + 2 = E$, $E + 2 = G$, $G + 2 = I$

$$C - 2 = A, A - 2 = Y, Y - 2 = W, W - 2 = U$$

$$D + 2 = F, F + 2 = H, H + 2 = J, J + 2 = L$$

$$G - 2 = E, E - 2 = C, C - 2 = A, A - 2 = Y$$

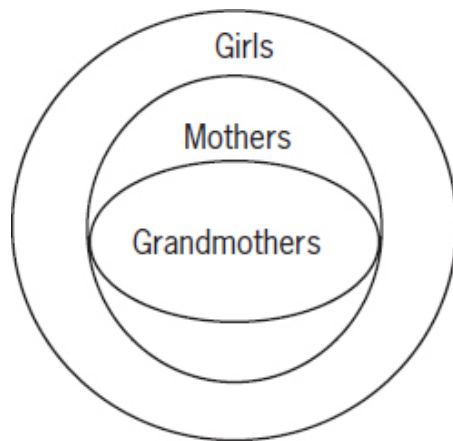
Therefore, ? = IULY

The correct answer is D.

47. Some mothers are also doctors and some fathers are also doctors.

The correct answer is D.

48. All grandmothers are definitely mothers, and all the mothers are girls for sure. Therefore, the Venn-diagram would be:

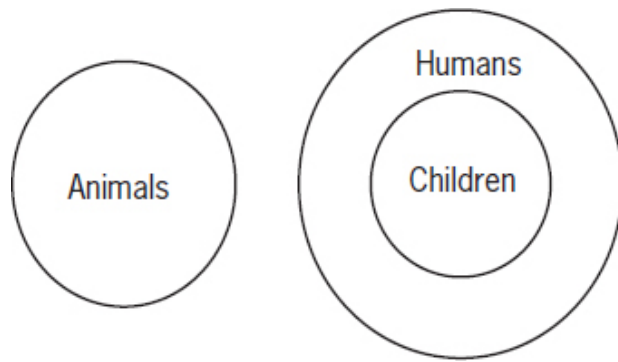


The correct answer is B.

49. If one object of group A completely belongs to another group B but both are entirely different from group C, so they are represented as

The correct answer is C.

50. The number of educated men who are in government job = 20
(common region to all)

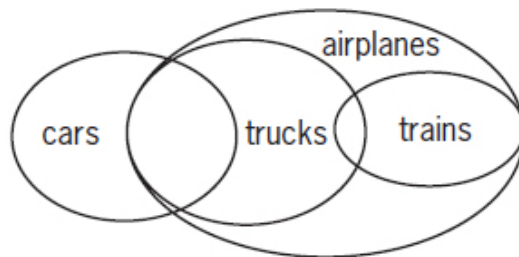
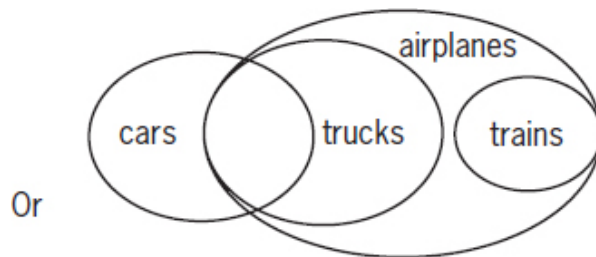
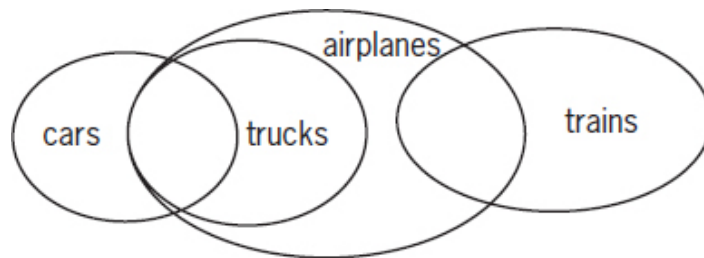


The correct answer is B.

51. The number of people in government job who are not educated = 15
+ 40 = 55

The correct answer is D.

52.



Check options.

Option (A): Some cars are trucks and all trucks are airplanes. So, some cars are airplanes. But it is not necessary that all cars are airplanes. So, (A) is not necessarily true.

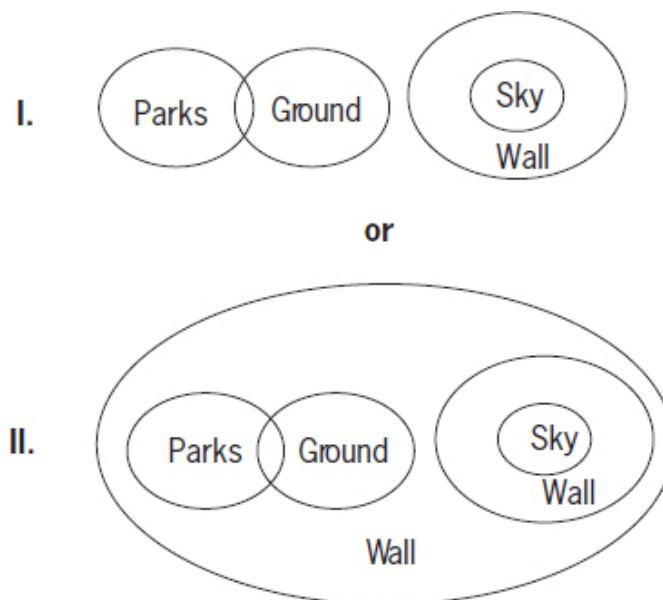
Option (B): Trucks and trains may or may not have anything common. So, “all trucks are trains” is not necessarily correct.

Option (C): Some airplanes are trains also means some trains are airplanes, which includes the possibility that all trains are airplanes. So, (C) is a correct answer.

Option (D): “No truck is a train” is a possibility. But, it is not necessarily true.

The correct answer is C.

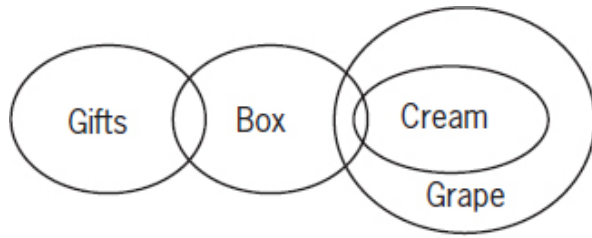
53.



As there is nothing said clearly about wall and park, so, either “some walls are park” or “No wall is a park” is possible but false individually. So, either I and III follows:

The correct answer is A.

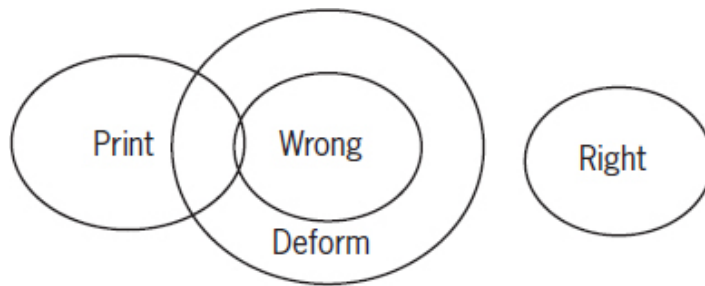
54. The possible Venn-diagram is



From the above venn diagram it is clear that the conclusion II “Some grapes are box” is true. As there is nothing said about cream and gift in the statements, so either “Some creams are gift” or “No cream is gift” is possible but false individually. So, either conclusion I or III and II follows.

The correct answer is A.

55. The possible Venn-diagram is:

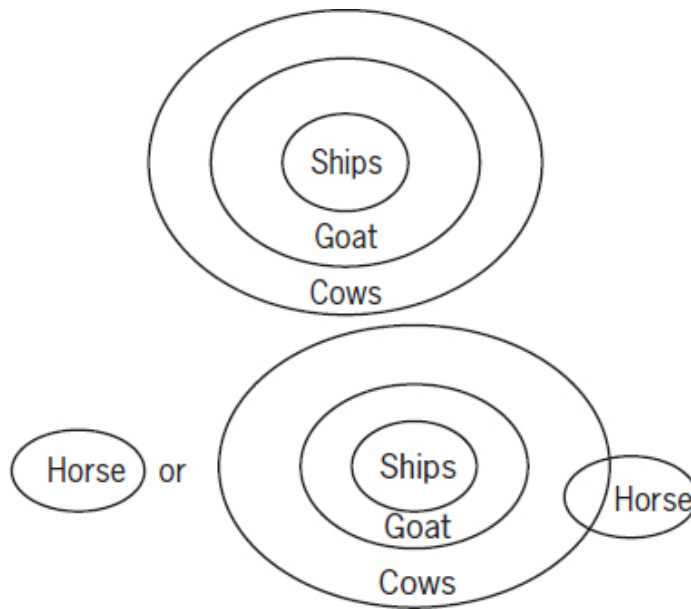


So, it is clear from diagram that conclusion I is true. But some print may be right or may not be roght. So, conclusion II doesn't follow clearly from the above Venn diagram. Conclusion III follows.

But conclusion IV doesn't follow as “All” strongly shows “Completely without failure but as “Some deform are wrong” is true which is showing uncertainty of the extent of deform being wrong.

The correct Answer is C.

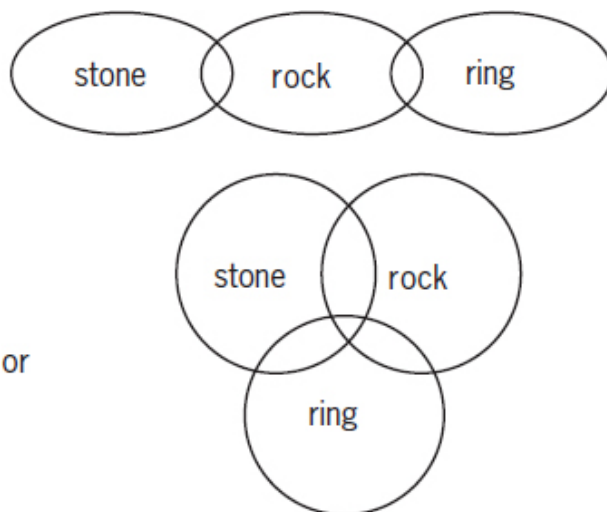
56. A possible Venn-diagram is.



As No horse is goat, it is clear that there may or may not be some relation between cow and horse. So either conclusion I or conclusion II follows.

The correct answer is C.

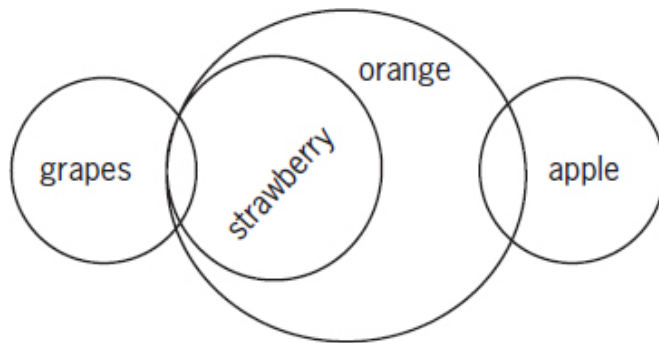
57. The possible Venn diagrams are



As, there is nothing is said about the relation of stone and ring, so either “Some stones are rings “ or “No stone is a ring “ but individually both are false. Again from the above Venn diagrams only conclusion II follows. That is, some stones are rocks.

The correct answer is B.

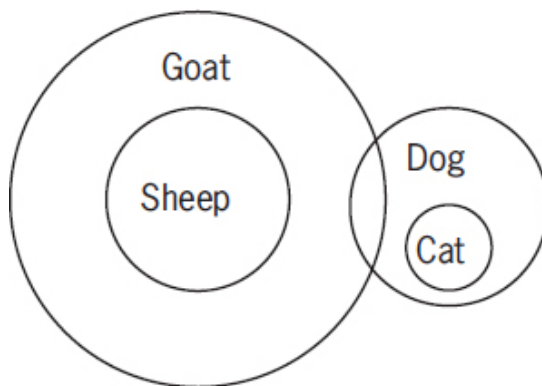
58. A possible Venn-diagram is as follow:



All strawberries may be Apples, but it is not necessarily true. Hence conclusion I does not follow. Since it is given that “some grapes are strawberries”, “some grapes are not strawberries” is not necessarily true, as it is quite possible that all grapes are strawberries.

The correct Answer is D.

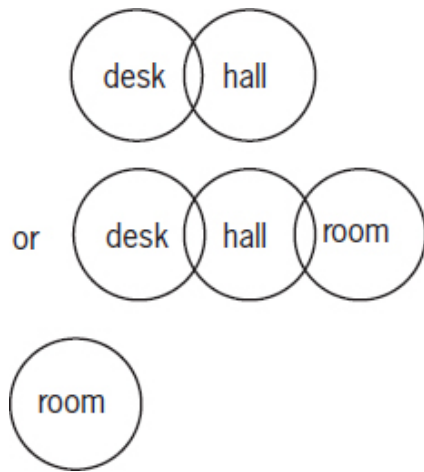
59. A possible Venn-diagram is:



The relation between cat, sheep and goat is not clear from the above Venn-diagram. So, ‘No cat is a sheep’ and ‘Some cats are goats’ does not necessarily follow. Hence neither I nor II follows.

The correct Answer is D

60. A possible Venn-diagram is:



As 'some' doesn't show the extent of certainty so conclusion I is wrong.

There is nothing said about hall and room so, conclusion II is wrong.

The correct Answer is D.



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