आगामी परीक्षा के लिए **परीक्षोपयोगी प्रश्नोत्तर** का सर्वश्रेष्ठ संकलन


**Co-curricular Course**

**Analytic Ability and Digital Awareness**

**B.A./B.Sc./B.Com.**

**III Year | Semester-V**

National Education Policy, 2020 Based

# New Syllabus

## Analytic Ability and Digital Awareness

### UNIT–I

Alphabet test, Analogy, Arithmetic Reasoning, Blood Relations, Coding and Decoding, Inequalities, Logical Venn Diagram, Seating Arrangements, Puzzles and Missing Numbers.

### UNIT–II

Syllogism, Pattern Completion and Figure Series, Embeded Figure and Counting of Figures, Cube and Dice, Paper Cutting and Folding, Data Sufficiency, Course of Action, Critical Reasoning, Analytical and Decision Making.

### UNIT–III

**Computer Basics:** Block Diagram of Digital Computer, Classification of Computers, Memory System, Primary Storage, Auxiliary Memory, Cache Memory, Computer Software (System/Application Software).

**MS-Word Basics:** The Word Screen, Getting to Word Documents, Typing and Revising Text, Finding and Replacing, Editing and Proofing Tools, Formatting Text Characters, Formatting Paragraph, Document Templates, Page Setup, Tables, Mail Merge, Macros, Protecting Documents, Printing a Document.

**MS-Excel:** Introduction, Worksheet Basics, Creating Worksheet, Heading Information, Data and Text, Date and Time, Alphanumeric Values, Saving and Quitting Worksheet, Opening and Moving Around in an Existing Worksheet, Toolbars and Menus, Excel Shortcut and Function Keys, Working with Single and Multiple Workbook, Working

with Formulae and Cell Referencing, Auto Sum, Coping Formulae, Absolute and Relative Addressing, Worksheet with Ranges, Formatting of Worksheet, Previewing and Printing Workseet, Graphs and Charts, Database, Creating and Using Macros, Multiple Worksheets-concepts.

**Introduction of Open Source Applications:** LibreOffice, OpenOffice and Google Docs etc.

## UNIT–IV

**Web Surfing:** An Overview: Working of Internet, Browsing the Internet, E-Mail, Components of E-Mail, Address Book, Troubleshooting in E-Mail, Browsers: Netscape Navigator, Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, Tor, Search Engines like Google, DuckDuckGo etc, Vising Web sites: Downloading.

**Cyber Security:** Introduction to Information System, Type of Information System, CIA model of Information Characteristics, Introduction to Information Security, Need of Information Security, Cyber Security, Phishing, Spamming, Fake New, General Issues Related to Cyber Security, Business Need, Ethical and Professional Issues of Security.



# Analytic Ability and Digital Awareness

## Unit-I

### 1. Alphabet Test

▶ As is clear from the name, this test is related to the very well known English Alphabets from A-Z. This test consists of following types of questions to which candidates have to be familiar with.

▶ **Type 1: Alphabetical Order of Words**

Arranging words in alphabetical order means to arrange them in the order in which they appear in the dictionary *i.e.* according to the order of letters with which they begin.

**Ex. 1** Which of the following words will come second in the English dictionary?

(a) Magical (b) Magnify

(c) Maternal (d) Magnetic

**Sol.** (d) The given words can be arranged in the alphabetical order as:

Magical, Magnetic , Magnify, Maternal

So, 'Magnetic' comes second.

Hence, (d) is the correct answer.

▶ **Type 2: Letter-Word Problems**

In this type, pairs of letters are arranged in the word in the same way as they occur in the dictionary. The stepes followed are:

(a) If the pairs are to be found in the word as they occur in the dictionary, then numbering of letters is to be done from left to right and right to left both.

| 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| C | O | R | P | O | R | A | T | E |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

But if the pairs are to be found in the word in the same sequence or in the same order or in the same alphabetical order as they occur in the dictionary, then numbering of letters is done from right to left only.

(b) Now, the respective alphabetical position numbers of all the letters is placed after them in the following manner:

| 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| C | O | R | P | O | R | A | T | E |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3 | 15 | 18 | 16 | 15 | 18 | 1 | 20 | 5 |

(c) Now the numbered letters and their respective alphabetical position number are added for both the series L-R and R-L.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12 | 23 | 25 | 22 | 20 | 22 | 4 | 22 | 6 |
| 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| C | O | R | P | O | R | A | T | E |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3 | 15 | 18 | 16 | 15 | 18 | 1 | 20 | 5 |
| 4 | 17 | 21 | 20 | 20 | 24 | 8 | 28 | 14 |

(d) In both the added sequences, the numbers which are repeated and also, the number of times they are repeated are written separately. The number of times, the number are repeated becomes the value of $n$ in $\frac{n(n-1)}{2}$.

$22 \rightarrow 3$ $\quad \frac{3(3-1)}{2} \rightarrow 3$ pairs

$20 \rightarrow 2$ $\quad \frac{2(2-1)}{2} \rightarrow 1$ pair

(e) From the given formula, we get the total number of pairs in the word from L-R and R-L both and these pairs are present at the same place where the numbers are repeated.

PO, PR, RT and PT *i.e.*, 4 pairs are present in the word CORPORATE. Among these PR, RT and PT are present in the same sequence *i.e.*, L-R but PO is present in the order R-L.

### ▸ Type 3: Rule Detection

Here, some rule is followed between alphabets in the word which is to be detected by the candidate.

**Ex. 2** Number of letters skipped in between adjacent letters in the series increases by one which of the following series observes the given rule?

(a) ACFJO (b) AEIMQ (c) DINSX (d) EHKNQ

**Sol.** (a) The given letter series is analysed as:

(a) [A] B [C] D E [F] G H I [J] K L M N [O]
1 2 3 4
+1 +1 +1

(b) [A] B C D [E] F G H [I] J K L [M] N O P [Q]
3 3 3 3
+0 +0 +0

(c) [D] E F G H [I] J K L M [N] O P Q R [S] T U V W [X]
4 4 4 4
+0 +0 +0

(d) [E] F G [H] I J [K] L M [N] O P [Q]
2 2 2 2
+0 +0 +0



Clearly in letter series ACFJO, the number of letters skipped in between adjacent letters increases by one.

Hence, (a) is the correct answer.

### ▸ Type 4: Alphabetical Quibble

In this type, a letter series is given be it from A-Z or a randomised sequence of letters. The candidate has to trace the letter satisfying certain conditions.

**Ex. 3** Given here an alphabet series

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

Which letter is fifth to the right of the eighteenth letter from your right?

(a) C (b) D
(c) E (d) N

**Sol.** (d) Counting from the right end of the given alphabet series *i.e.* from Z the eighteenth letter is I. Counting from I towards the right the fifth letter is N.

Hence, (d) is the correct answer.

### ▸ Type 5: Word Formation by Unscrambling Letters

In this type, a set of English letters is given in a jumbled order. The candidate is required to arrange these letters to form a meaningful word.

**Ex. 4** Given below are the letters of a word marked as (a), (b), (c), (d). Arrange these letters to a form a meaningful word and indicate the last letter of the word as the answer.

(a) I (b) B
(c) H (d) T

**Sol.** (d) Clearly the given letters may be rearranged to form the word 'HABIT' so the last letter is T.

Hence, (d) is the correct answer.

### ▸ Type 6: Word Formation Using Letters of a Given Word

In this, some of the given letters of a given word are arranged to form a meaningful word.

**Ex. 5** If it is possible to form a word with the first, fourth, seventh and eleventh letters of the word 'SUPERFLUOUS', write the first letter of that word, otherwise X is the answer.

(a) S (b) L
(c) O (d) E

**Sol.** (d) 'LESS' is the word which is formed by using first, fourth, seventh and eleventh letters of the word SUPERFLUOUS, first letter of this word is 'L'.

Hence, (b) is the correct answer.

## Multiple Choice Questions ▼

Q 1. Arrange the given words in alphabetical of order and choose the one that comes at the second place.
a. Plane b. Plain c. Plenty d. Player

**Directions (Q. Nos. 2-5) :** In each of the following questions, four words are given. Which of them will come in the third place if all of them are arranged alphabetically as in a dictionary?

Q 2. a. Haste b. Haphazard c. Host d. Hang.
Q 3. a. Apology b. Branch c. Antigen d. Antique.
Q 4. a. Animate b. Animosity c. Anguish d. Ankle.
Q 5. a. Radical b. Radiate c. Racket d. Radius.

Q 6. Find the two letters in the word EXTRA which have as many letters between them in the word as in the alphabet. If these two letters are arranged in alphabetical order, which letter will come second?
a. A b. E c. R d. T.

Q 7. The position of how many letters in the word BRAKES remains unchanged when they are arranged in alphabetical order?
a. One. b. Two c. Three d. More than three.

Q 8. If the letters of the word TRANSFORM are rearranged as they appear in the English alphabet, then the position of how many letters will remain unchanged after such rearrangement?
a. One b. Two c. Three d. None of these.

Q 9. The positions of how many letters in the word WONDERFUL will remain unchanged when the letters within the word are arranged alphabetically?
a. One b. Two c. Three d. None of these.

Q 10. If the positions of the third and tenth letters of the word DOCUMENTATION are interchanged, and likewise the positions of the fourth and seventh letters, the second and sixth letters, is also interchanged, which of the following will be eleventh letter from the right end?
a. C b. I c. T d. U.

Q 11. If the first and the second letters of the word UNPRECEDENTED are interchanged with the last and the second last letters and similarly the third and the fourth letters are interchanged with the third and the fourth letters from the last respectively, then what will be the seventh letter to the right of the third letter from the left?
a. C b. E c. P d. R.

**Directions (Q. Nos. 12-16):** In each of the following questions, find out which of the letter series follows the given rule.

Q 12. Number of letters skipped in between adjacent letters in the series is two.
a. MPSVYBE b. QSVYZCF c. SVZCGJN d. ZCGKMPR.



Q 13. The group of letters should not contain more than two vowels.
a. BDEJOLY b. JKAPIXU
c. PRAQEOS d. ZILERAM.

Q 14. Number of letters skipped in between adjacent letters in the series is odd.
a. BDHLR b. EIMQV c. FIMRX d. MPRUX.

Q 15. Number of letters skipped in between the adjacent letters in the series is equal.
a. HKNGSW b. RVZDFG c. RVZDHL d. SUXADF.

Q 16. Number of letters skipped in between the adjacent letters in the series are consecutive even numbers.
a. ADIPY b. CDFIM c. DFJPX d. GIMSZ.

Q 17. Which letter should be ninth letter to the left of ninth letter from the right, if the first half of the alphabet series is reversed ?
a. D b. E c. F d. I.

Q 18. If the second half of the alphabet series is written in the reverse order, which letter will be seventh to the right of the twelfth letter from the left end?
a. R b. S c. U d. V.

Q 19. If the last ten letters of the alphabet series are written in the reverse order, which of the following will be the sixth to the right of the thirteenth letter from the left end?
a. U b. V c. W d. X.

**Directions (Q. Nos. 20-24):** In each of the following questions is based on the following alphabet series:

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

Q 20. Which letter is exactly midway between G and Q in the given alphabet?
a. K b L c. M d. N.

Q 21. Which letter is midway between the eighteenth letter from the left end and tenth letter from the right end of the given alphabet?
a. No letter b. K c. Q d. R.

Q 22. Which letter in the alphabet is as far from G as T is from M?
a. M b. N c. O d. P.

Q 23. Which letter is sixteenth to the right of the letter which is fourth to the left of I?
a. S b. T c. U d. V.

Q 24. Which letter will be the eighth to the right of the third letter of the second half of the English alphabet?
a. V b. W c. X d. Y.

**Q 25.** If it is possible to make a meaningful word out of the second, the fourth, the fifth and the eighth letters of the word ILLOGICAL, then which of the following will be the third letter of the so formed word ? If more than one word can be formed, then give 'X' as the answer. If no meaningful word can be formed, then give 'Z' as the answer.

a. A b. G c. O d. X.

**Q 26.** If it is possible to make a meaningful word with the fourth, the seventh, the eleventh and the thirteenth letters of the word CATEGORISATION, which of the following will be the first letter of that word ? If no such word can be made, give 'X' as the answer. If more than one such words can be made, give 'M' as the answer.

a. O b. R c. T d. M.

**Q 27.** How many meaningful words can be formed with the first, the third, the seventh and the ninth letters of the word SEPARATION using each letter only once in each word?

a. One b. Two c. Three d. More than four.

**Q 28.** Pick the first, second, fourth, fifth and sixth letters of the word REASONING, form yet another word and then write the first and the last letters of the word formed.

a. OR b. NE c. SE d. ES.

**Q 29.** How many such pairs of letters are there in the word CLEARING each of which has two letters between them in the word as also in the alphabet ?

a. Nil b. One c. Two d. Three.

**Q 30.** How many pairs of letters are there in the word REPERCUSSION which have as many letters between them in thw word as in the alphabet and that too in the same order?

a. Nil b. One c. Two d. Three.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (a) | **2.** | (a) | **3.** | (a) | **4.** | (b) | **5.** | (a) | **6.** | (b) | **7.** | (b) | **8.** | (a) |
| **9.** | (a) | **10.** | (c) | **11.** | (d) | **12.** | (a) | **13.** | (a) | **14.** | (a) | **15.** | (c) | **16.** | (a) |
| **17.** | (b) | **18.** | (c) | **19.** | (d) | **20.** | (b) | **21.** | (a) | **22.** | (b) | **23.** | (c) | **24.** | (c) |
| **25.** | (d) | **26.** | (d) | **27.** | (d) | **28.** | (c) | **29.** | (a) | **30.** | (b). | | | | |



# 2. Analogy Test

## Verbal

Analogy literally means 'similarity' having a similar features. Questions on analogy test the ability of a candidate to understand the relationship between two given objects and apply the same relationship to find that asked in the question. This test involves four different types as discussed here.

### 1. Word Analogy

There are many ways of establishing word relationship, some of the most common ones are given here.

▸ **Cause and Effect**

**Ex. 1** 'Goitre' is related to 'Iodine' as 'Anaemia' is related to:

(a) Vitamin (b) Blood (c) Iron (d) Weakness

**Sol.** (c) The above question is based on cause and effect relationship. 'Goitre' disease is caused by the deficiency of 'Iodine'. So, if 'Goitre' is related to 'Iodine', then 'Anaemia' will be related to 'Iron' as 'Anaemia' disease is caused by the deficiency of 'Iron'. Hence, our answer is (c).

▸ **Subset of Set**

**Ex. 2** 'Page' is related to 'Book' as 'Leaf' is related to:

(a) Root (b) Green (c) Tree (d) Forest

**Sol.** (c) 'Page' is a part of 'Book' and in the same way we see that 'Leaf' is a part of 'Tree'. Hence, our answer is (c).

▸ **Quantity and Unit**

**Ex. 3** 'Current' is related to 'Ampere' in the same way as 'Weight' is related to:

(a) Scale (b) Pound (c) Commodity (d) Measurement

**Sol.** (b) 'Current' is measured in terms of 'Ampere' and 'Weight' is measured in terms of 'Pound'. Hence, our answer is (b).

▸ **Instrument and Measurement**

**Ex. 4** 'Seismograph' is related to 'Earthquakes' in the same way as 'Thermometer' is related to:

(a) Fever (b) Doctor (c) Temperature (d) Mercury

**Sol.** (c) Relationship given in the question is the relationship between instrument and measurement. 'Seismograph' measures 'Earthquakes' and 'Thermometer' measures 'Temperature'. Hence, our answer is (c).

▸ **Worker and Tools**

**Ex. 5** 'Doctor' is related to 'Stethoscope' in the same way as 'Painter' is related to:

(a) Painting (b) Brush (c) Exhibition (d) Art

**Sol.** (b) 'Stethoscope' is used by the 'Doctor' as a tool to perform his work. Similarly, a 'Painter' uses a 'Brush' as a tool to perform his work. Hence, our answer is (b).

▸ **Sex Relationship**

**Ex. 6** 'Bull' is related to 'Cow' in the same way as 'Horse' is related to:

(a) Animal (b) Mare (c) Stable (d) Meat

**Sol.** (b) The relationship in question is a male-female relationship. So, 'Horse' is related to 'Mare'. Hence our answer is (b).

▸ **Word and Synonym**

**Ex 7.** 'Dearth' is related to 'Scarcity' in the same way as 'Substitute' is related to:

(a) Replace (b) Rumour (c) Destroy (d) Assume

**Sol.** (a) 'Scarcity' is synonym of 'Dearth'. In the same way, 'Replace' is a word nearest in meaning to the word 'Substitute.' Hence, our answer is (a).

▸ **Word and Antonym**

**Ex 8.** 'Hate' is related to 'Love' in the same way as 'Create' is related to:

(a) Make (b) Renovate (c) Destroy (d) Build

**Sol.** (c) 'Love' is just opposite to 'Hate'. So, the word opposite in meaning to 'Create' is 'Destroy'. Hence, our answer is (c).

▸ **Worker and Working Place**

**Ex. 9** 'Sailor' is related ro 'Ship' in the same way as 'Lawyer' is related to:

(a) Legal (b) Law (c) Court (d) Ruling

**Sol.** (c) The place of work of 'Sailor' is 'Ship'. Similarly, the place where 'Lawyer' works is 'Court'. Hence, our answer is (c).

▸ **Study and Terminology**

**Ex. 10** 'Numismatic' is related to 'Coin' in the same way as 'Paleontology' is related to:

(a) Earth (b) Soil (c) Fossils (d) Stones

**Sol.** (c) Study of Coin is known as 'Numismatic'. 'Paleontology' is the science dealing with study of history of mankind with the help of 'Fossils'. Hence, our answer is (c).

▸ **Product and Raw Material**

**Ex. 11** 'Shoes' is related to 'Leather' in the same way as 'Rubber' is related to:

(a) Plastic (b) Polythene (c) Latex (d) Chappal

**Sol.** (c) 'Leather' is a raw material used to make 'Shoes'. Similarly, 'Rubber' is made using 'Latex' as raw material. Hence, our answer is (c).

▸ **Worker and Product**

**Ex. 12** 'Carpenter' is related to 'Furniture' in the same way as 'Blacksmith' is related to:

(a) Gold (b) Jewellery (c) Shoes (d) Metal

**Sol.** (d) 'Carpenter' makes 'Furniture'. Similarly, 'Blacksmith' makes 'Metal'. Hence, our answer is (d).



▸ **Association Relationship**

**Ex. 13** 'Melt' is related to 'Liquid' in the same way as 'Freeze' is related to:

(a) Ice (b) Crystal (c) Water (d) Cubes

**Sol.** (a) The term 'Melt' is associated with 'Liquid' because after melting the ice, we obtain liquid. Similarly, the state of 'Water' after freezing is 'Ice'. Hence, our answer is (a).

**2. Number Analogy**

In this type, there is a certain relationship between two given numbers and students have to choose another number related to a given number in the same manner. Sometimes, a similarly related pair has to be chosen as the given number pair on the basis pf the relation between the numbers in each pair.

**Ex. 14** Choose the best alternative to establish the relationship :

3 : 11 :: 7 : ?

(a) 22 (b) 29 (c) 18 (d) 51

**Sol.** (d) Clearly, $3^2 + 2 = 11$, Now $7^2 + 2 = 51$.

So, if the first number is $x$, the second number is $x^2 + 2$.

Thus, the relationship is $x : x^2 + 2$.

Hence, our answer is (d).

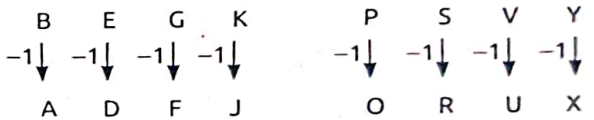
**3. Letter Analogy**

In this type, two groups of letters are related to each other and the candidate is required to find out this relationship to choose a letter group related in the same way to a third group provided in the question.

**Ex. 15** BEGK is related ADFJ in the same way as PSVY is related to:

(a) LOQT (b) ROUX (c) OTUZ (d) ORUX

**Sol.** (d) Clearly, each letter of the first group in a pair is moved one step backward to obtain the corresponding letter of the second group.




Hence, our answer is (d).

**4. Mixed Analogy**

This type involves a combination of letters and numbers and students are required to establish the relationship.

**Ex. 16** B : 16 :: D : ?

(a) 120 (b) 150 (c) 200 (d) 256

**Sol.** (d) B is the 2nd letter of the English alphabet and $2^4 = 16$.

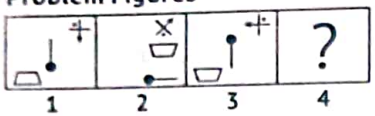
Similarly, D is the 4th letter of the English alphabet and $4^4 = 256$.

Hence, our answer is (d).

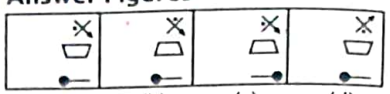
## Non-Verbal

▸ **Type 1:** In this type, two sets of figures namely problem figures and answer figures are given. The set of problem figures consists of two parts. The first part comprises two figures which have same relationship between them on the basis of certain rule. The second part comprises one figure and a sign of (?). Students are asked to select one figure from the set of answer figures which replaces the sign of (?). In such a way that it bears same relationship with the other figure as first figure of the first part bears with second figure of the same part.

**Ex. 17** **Problem Figures**

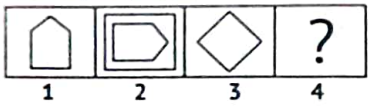



**Answer Figures**

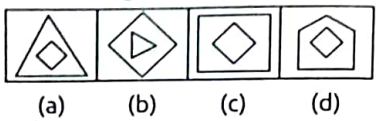



**Sol.** (c) From problem figure (1) to (2) the pin rotates 90° clockwise, the trapezium is inverted and the third figure rotates 135° anticlockwise. The same rule will apply to obtain figure (4) from figure (3). Hence, answer figure (c) will replace the sign of (?).

**Ex. 18** **Problem Figures**



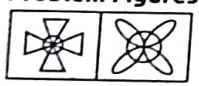

**Answer Figures**



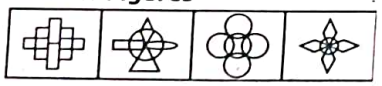

**Sol.** (a) From problem figure (1) to (2), the pentagon rotates 90° clockwise and a square having four sides covers it. Similarly, from figure (3) to (4) the square (having four sides) rotates 90° clockwise and will be covered by a triangle (having three sides). Hence, answer figure (a) will replace the sign of (?).

➤ **Type 2:** In this section of classification, two figures namely problem figures are followed by four figures namely answer (a, b, c, d). Both the problem figures are associated with each other based on some common characteristics. One of the answer figures belongs to the group of problem figures on the basis of these common characteristics. Candidates are required to select that figure which belongs to the group of problem figures, that figure is your answer.

**Ex.19** **Problem Figures**



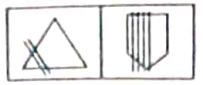
**Answer Figures**




**Sol.** (d) Four identical figures are connected with one another at the centre of the circle. Answer figure (d) also possesses same characteristics and hence belongs to the same group.



**Ex. 20** **Problem Figures**



**Answer Figures**


**Sol.** (d) The number of lines intersecting the figure is one less than the number of sides of the figure. Answer figure (d) has the same characteristics and therefore belongs to the group of problem figures.

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-10 ):** In the following questions, there is a certain relationship between two given words on one side of :: and one word is given on another side of : : while another word is to be found from the given alternatives, having the same relation with this word as the words of the given pair bear. Choose the correct alternative.

**Q 1. Cricket : Bat : : Hockey : ?**
a. Field b. Stick c. Player d. Ball.

**Q 2. Bird : Wing : : Fish : ?**
a. Gill b. Fin c. Tail d. Scale.

**Q 3. Smoke : Pollution :: War: ?**
a. Destruction b. Treaty c. Victory d. Peace.

**Q 4. Coconut : Shell :: Letter : ?**
a. Letter-box b. Stamp c. Mail d. Envelope.

**Q 5. Kandla : Gujarat :: Cochin : ?**
a. Karnataka b. Kerala c. Goa d. Chennai.

**Q 6. Chair : Furniture :: Shoe : ?**
a. Socks b. Footwear c. Leather d. Cobbler.

**Q 7. Touch : Feel : : Greet : ?**
a. Smile b. Manners c. Acknowledge d. Success.

**Q 8. Girl : Beautiful :: Boy : ?**
a. Smart b. Heroic c. Courageous d. Handsome.

**Q 9. Haemoglobin : Iron :: Chlorophyll : ?**
a. Copper b. Magnesium c. Cobalt d. Calcium.

**Q 10. Thunder : Rain : : ?: Night**
a. Evening b. Dark c. Day d. Dusk.

**Q 11. *Leaf* is related to *Sap* in the same way as *Bone* is related to:**
a. Fluid b. Blood c. Marrow d. Calcium.

**Q 12. *Town* is related to *Village* in the same way as *Urban* is related to:**
a. City b. Metropolis c. Rural d. Semi-urban.

**Q 13. *Sugar* is related to *Molasses* in the same way as *Gasoline* is related to:**
a. Mine b. Quarry c. Drill d. Petroleum.

**Q 14. *Engineer* is related to *Machine* in the same way as *Doctor* is related to:**
a. Hospital b. Body c. Disease d. Medicine.

**Q 15.** *Drama* is related to *Director* in the same way as *Magazine* is related to:
a. Story b. Editor c. Reader d. Printer.

**Q 16.** *Rhythm* is related to *Music* in the same way as *Design* is related to:
a. Symmetry b. Architect c. Beauty d. Building.

**Directions (Q. Nos. 17-22):** In each of the following questions, there is a certain relationship between two given numbers on one side of : : and one number is given on another side of : : while another number is to be found from the given alternatives, having the same relationship with this number as the numbers of the given pair bear. Choose the best alternative.

**Q 17.** 42 : 20 : : 64 : ?
a. 31 b. 32 c. 33 d. 34.

**Q 18.** 121 : 12 : : 25 : ?
a. 1 b. 2 c. 6 d. 7.

**Q 19.** 6 : 222 : : 7 : ?
a. 210 b. 336 c. 343 d. 350.

**Q 20.** 26 : 5 : : 65 : ?
a. 6 b. 7 c. 8 d. 9.

**Q 21.** 25 : 125 : : 36 : ?
a. 180 b. 206 c. 216 d. 318.

**Q 22.** 14 : 9 : : 26 : ?
a. 12 b. 13 c. 15 d. 31.

**Directions (Q. Nos. 23-26):** Each of the following questions consists of a pair of numbers that have a certain relationship each other, followed by four other pairs of numbers given as alternatives. Select the pair in which the numbers are similarly related as in the given pair.

**Q 23.** 12 : 144
a. 22 : 464 b. 20 : 400 c. 15 : 135 d. 10 : 140.

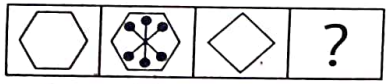
**Q 24.** 27 : 9
a. 64 : 8 b. 125 : 5 c. 135 : 15 d. 729 : 81.

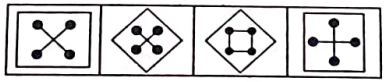
**Q 25.** 5 : 35
a. 7 : 77 b. 9 : 45 c. 11 : 55 d. 3 : 24.

**Q 26.** 8 : 256
a. 7 : 343 b. 9 : 243 c. 10 : 500 d. 5 : 75.

**Directions (Q. Nos. 27-36):** Each of the following questions consists of two set of figures. There is a definite relationship between figures A and B. Establish a similar relationship between figures C and D by selecting a suitable figure from the answer set.

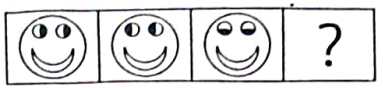
**Q 27.**



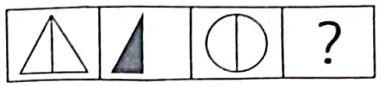



**Q 28.**



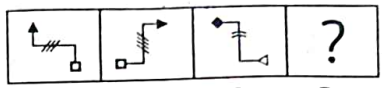


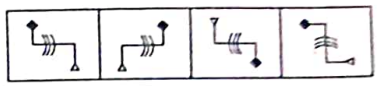
**Q 29.**



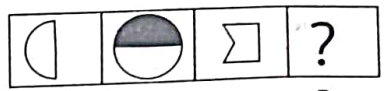


**Q 30.**



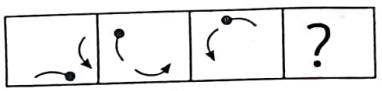



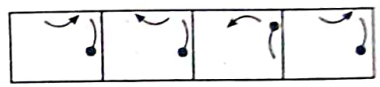

**Q 31.**



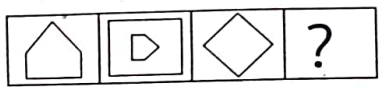


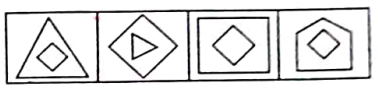
**Q 32.**



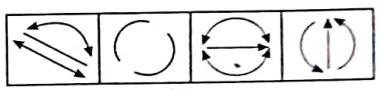




**Q 33.**

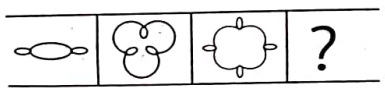


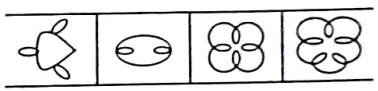




**Q 34.**

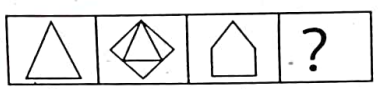



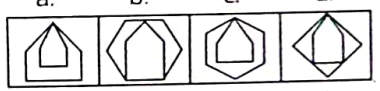

**Q 35.**




**Q 36.**




## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (b) | **3.** | (a) | **4.** | (d) | **5.** | (b) | **6.** | (b) | **7.** | (c) | **8.** | (d) |
| **9.** | (b) | **10.** | (a) | **11.** | (c) | **12.** | (c) | **13.** | (d) | **14.** | (c) | **15.** | (b) | **16.** | (d) |
| **17.** | (a) | **18.** | (c) | **19.** | (d) | **20.** | (c) | **21.** | (c) | **22.** | (c) | **23.** | (b) | **24.** | (d) |
| **25.** | (a) | **26.** | (c) | **27.** | (b) | **28.** | (d) | **29.** | (d) | **30.** | (b). | **31.** | (c) | **32.** | (d) |
| **33.** | (a) | **34.** | (d) | **35.** | (d) | **36.** | (c). | | | | | | | | |

# 3. Arithmetical Reasoning

▶ This chapter deals with arithmetic problems involving calculations, venn diagrams or data based as well as problems on ages.

▶ **Type 1. Calculation based Problems**

Here, problems related to certain calculations are given.

**Ex. 1** The number of boys in a class are three times the number of girls. Which one of the following numbers cannot represent the total number of childrens in the class?

(a) 48 (b) 44 (c) 42 (d) 40.

**Sol.** (c) Let the number of girls be $x$, then from the question it is clear that number of boys are $3x$.

Therefore, total no. of students

= Number of boys + Number of girls

$= x + 3x = 4x$

Now, the total number of childrens in the class must be a multiple of 4. Out of the four options (c) does not qualify this condition. Hence, 42 does not represent the total number of childrens in the class.

▶ **Type 2. Data based Questions or Venn Diagram based Problems**

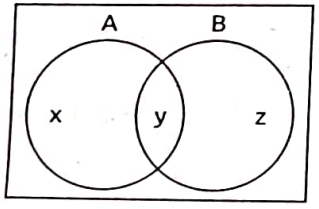
In this type, some information regarding certain items *i.e.*, their data is given and candidate has to solve them using Venn diagram.

**Ex. 2** In a town, 65% people watch the news on television, 40% read a newspaper and 25% read a newspaper and watch the news on television also. What percent of the people neither watch the news on television nor read a newspaper?

(a) 5 (b) 10

(c) 15 (d) 20

**Sol.** (d) Let the total number of people be 100.




Let circle A represent people who watched television and B represent people who read newspaper.

Then $x + y = 65, y + z = 40, y = 25$

We get, $x = 40, y = 25, z = 15$



Then number of people who neither watched television nor read newspaper

$= 100 - (x + y + z)$

$= 100 - (40 + 25 + 15) = 100 - 80 = 20$

Therefore, required percentage is 20%.

▶ **Type 3. Problems on Ages**

Questions related to ages of some persons are given so as to find out the age of a particular one.

**Ex. 3** The sum of the ages of a son and father is 56 yr. After 4 yr, the age of the father will be three times that of the son. Their ages respectively are:

(a) 12 yr, 44 yr (b) 16 yr, 42 yr

(c) 16 yr, 48 yr (d) 18 yr, 36 yr

**Sol.** (a) Let the age of the father be $x$, then the age of the son would be $(56 - x)$. After four years, the age of father would be $(x + 4)$ and that of son would be $(56 - x + 4)$.

Now, from the information given in the questions.

We have

$(x + 4) = 3\,(56 - x + 4)$

$x + 4 = 168 - 3x + 12$

$4x = 168 + 12 - 4 = 176$

$x = 44$ yr

Therefore, the age of father and son is 44 yr and 12 yr respectively.

## Multiple Choice Questions ▼

**Q 1. Aruna cut a cake into two halves and cuts one half into smaller pieces of equal size. Each of the small pieces is twenty grams in weight. If she has seven pieces of the cake in all with her, how heavy was the original cake?**

a. 120 grams b. 140 grams

c. 240 grams d. 280 grams.

**Q 2. At the end of a business conference, the ten poeple present all shake hands with each other once. How many handshakes will there be altogether?**

a. 20 b. 45 c. 55 d. 90.

**Q 3. First bunch of bananas has $\frac{1}{2}$ again as many bananas as a second bunch. If the second bunch has 3 bananas less than the first bunch, then the number of bananas in the first bunch is:**

a. 9 b. 10 c. 12 d. 15.

Q 4. The 30 members of a club decided to play a badminton singles tournamen Every time a member loses a game he is out of the tournament. There a no ties. What is the minimum number of matches that must be played t determine the winner?

a. 15 b. 29 c. 61 d. None of these.

Q 5. A pineapple costs ₹ 7 each. A watermelon costs ₹ 5 each. X spends ₹ 38 o these fruits. The number of pineapples purchased is:

a. 2 b. 3 c. 4 d. Data inadequate

Q 6. A student got twice as many sums wrong as he got right. If he attempted 4 sums in all, how many did he solve correctly?

a. 12 b. 16 c. 18 d. 24.

Q 7. If you write down all the numbers from 1 to 100, then how many times do yo write 3?

a. 11 b. 18 c. 20 d. 21.

Q 8. Three friends had dinner at a restaurant. When the bill was received, Amita paid $\frac{2}{5}$ as much as Veena paid and Veena paid $\frac{1}{2}$ as much as Tanya paid. What fraction of the bill did Veena pay?

a. $\frac{1}{3}$ b. $\frac{3}{11}$ c. $\frac{12}{31}$ d. $\frac{5}{8}$.

Q 9. In a class, $\frac{3}{5}$ of the students are girls and rest are boys. If $\frac{2}{9}$ of the girls and $\frac{1}{4}$ of the boys are absent, what part of the total number of students is present?

a. $\frac{17}{25}$ b. $\frac{18}{49}$ c. $\frac{23}{30}$ d. $\frac{23}{36}$.

Q 10. An institute organised a fete and $\frac{1}{5}$ of the girls and $\frac{1}{8}$ of the boys participated in the same. What fraction of the total number of students took part in the fete?

a. $\frac{2}{13}$ b. $\frac{13}{40}$

c. Data inadequate d. None of these.

Q 11. After distributing the sweets equally among 25 children, 8 sweets remain. Had the number of children been 28, 22 sweets would have been left after equal distribution. What was the total number of sweets?

a. 328 b. 348 c. 358 d. Data inadequate.



Q 12. In a cricket match, five batsmen A, B, C, D and E scored an average of 36 runs. D scored 5 more than E; E scored 8 fewer than A; B scored as many as D and E combined; and B and C scored 107 between them. How many runs did E score?

a. 62 b. 45

c. 28 d. 20.

Directions (Q. Nos. 13-15): Study the information given below and answer the questions that follow:

A publishing firm publishes newspapers A, B and C. In an effort to persuade advertisers to insert advertisements in these newspapers, the firm sends out the following statement to possible advertisers:

A survey of representative sample of the whole population shows that :

Newspaper A is read by 26%;

Newspaper B is read by 25%;

Newspaper C is read by 14%;

Newspapers A and B are read by 11%;

Newspapers B and C are read by 10%;

Newspapers C and A are read by 9%;

Newspapers C only is read by 0%.

Q 13. The percentage of readers who read all the three newspapers is:

a. 1 b. 4

c. 5 d. 6.

Q 14. The percentage of readers who read at least one of the three newspapers is:

a. 40 b. 50

c. 60 d. 65.

Q 15. The percentage of readers who read A and B but not C is:

a. 2 b. 4 c. 5 d. 6.

## ANSWERS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (c) | **2.** | (b) | **3.** | (d) | **4.** | (b) | **5.** | (c) | **6.** | (b) | **7.** | (c) | **8.** (b) |
| **9.** | (c) | **10.** | (a) | **11.** | (c) | **12.** | (d) | **13.** | (c) | **14.** | (a) | **15.** | (d) | |

## 4. Blood Relations Test

- This test involves the analysis of information showing blood relationship amo members of family. Here, a chain of relationship is given in the form of information a the success of candidate depends upon his/her knowledge of blood relations.
- These relationships can be used to solve various types of problems related to blo relations:

1. Grandfather's Son — Father or Uncle
2. Grandfather's only Son — Father
3. Grandmother's only Son — Father
4. Mother's or Father's Mother — Grandmother
5. Mother's or Father's Father — Grandfather
6. Grandfather's only Daughter-in-law — Mother
7. Grandmother's only Daughter-in-law — Mother
8. Mother's or Father's Son — Brother
9. Mother's or Father's Daughter — Sister
10. Mother's or Father's Brother — Uncle
11. Mother's or Father's Sister — Aunt
12. Husband or Wife's Sister — Sister-in law
13. Husband or Wife's Brother — Brother-in-law
14. Son's Wife — Daughter-in-law
15. Daughter's Husband — Son-in-law
16. Brother's Son — Nephew
17. Brother's Daughter — Niece
18. Uncle or Aunt's Son or Daughter — Cousin
19. Sister's Husband — Brother-in-law
20. Brother's Wife — Sister-in-law

A relation on mother's side is called 'maternal' while that on father's side is called 'paternal'. Mother's Brother is 'maternal uncle' while father's brother is 'paternal uncle.'

- **Type 1. Jumbled up Descriptions:** In this type description in the form of small relationship is given and analysis is made about the relations.

**Ex. 1** Pointing towards a person a man said to woman, "His mother is the only daughter of your father". How is the woman related to that person?

(a) Daughter (b) Sister
(c) Mother (d) Wife

**Sol.** (c) The only daughter of woman's father is she herself. So, the person is women's son *i.e.* the woman is the person's mother. Hence, answer is (c).



- **Type 2. Relation Puzzle:** In this type, mutual blood relations of more than two persons are mentioned. Candidate has to analyse the information and find the relation.

**Ex. 2** A is B's sister. C is B's mother, D is C's father. E is D's mother, then how is A related to D?

(a) Grandmother (b) Grandfather (c) Daughter (d) Granddaughter

**Sol.** (d) A is the sister of B and B is the son/daughter of C. So, A is the daughter of C. Also, D is the father of C. Thus, A is the granddaughter of D.

Hence, answer is (d).

- **Type 3. Coded Relations:** In this type, the relationships are represented by certain specific codes or symbols such as +, −, #, ×, ÷, $, @ etc. Candidate has to analyse the codes to determine the relationship.

**Ex. 3** If 'P + Q' means 'P is the father of Q'.
'P × Q' means 'P is the brother of Q'
'P−Q' means 'P is the mother of Q'
Then, which of the following is definitely true about C − A + B?

(a) B is the son of A (b) A is the son of C
(c) B is the father of A (d) C is the mother of B.

**Sol.** (b) C − A + B means C is the mother of A, who is the father of B. This clearly implies that A is male, hence the son of C.

Hence, answer is (b).

## Multiple Choice Questions ▼

**Q 1. Pointing to a man on the stage Rashi said, "He is the brother of the daughter of the wife of my husband." How is the man on the stage related to Rashi?**

a. Son b. Husband c. Cousin d. Nephew.

**Q 2. A woman introduces a man as the son of the brother of her mother. How is the man related to the woman?**

a. Nephew b. Son c. Cousin d. Uncle.

**Q 3. Introducing a man, a woman said, "He is the only son of my mother's mother." How is the woman related to the man?**

a. Mother b. Aunt c. Sister d. Niece.

**Q 4. Pointing towards a boy, Veena said, "He is the son of only son of my grandfather." How is that boy related to Veena?**

a. Uncle b. Brother c. Cousin d. Data inadequate.

**Q 5. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?**

a. His own b. His son's c. His father's d. His nephew's.

Q 6. Introducing a man, a woman said, "His wife is the only daughter of my fath How is that man related to the woman?

a. Brother b. Father-in-law
c. Maternal uncle d. Husband.

Q 7. Pointing to a man in a photograph, Asha said, "His mother's only daughter my mother." How is Asha related to that man?

a. Nephew b. Sister c. Wife d. Niece.

Q 8. Pointing to Kapil, Shilpa said, "His mother's brother is the father of my s Ashish." How is Kapil related to Shilpa ?

a. Sister-in-law b. Nephew c. Niece d. Aunt.

Q 9. Showing the man receiving the prize, Saroj said, "He is the brother of m uncle's daughter." Who is the man to Saroj?

a. Son b. Brother-in-law
c. Nephew d. Cousin.

Q 10. When Anuj saw Manish, he recalled, "He is the son of the father of m daughter's mother." Who is Manish to Anuj?

a. Brother-in-law b. Brother c. Cousin d. Uncle.

Q 11. Pointing to a girl in the photograph, Amar said, "Her mother's brother is th only son of my mother's father." How is the girl's mother related to Amar?

a. Mother b. Sister c. Aunt d. Grandmother.

Q 12. A man said to a lady, "Your mother's husband's sister is my aunt." How is th lady related to the man?

a. Daughter b. Granddaughter
c. Mother d. Sister.

Q 13. If Neena says, "Anita's father Raman is the only son of my father-in-law Mahipal", then how is Bindu, who is the sister of Anita, related to Mahipal?

a. Niece b. Daughter c. Wife d. None of these.

Q 14. P is the son of Q while Q and R are the sisters to one another. T is the mother of R. If S is the son of T, which of the following statements is correct?

a. T is the brother of Q. b. S is the cousin of P.
c. Q and S are sisters. d. S is the maternal uncle of P.

Q 15. Q is the brother of R, P is the sister of Q, T is the brother of S, S is the daughter of R. Who are the cousins of Q?

a. R and P b. P and T c. Q and T d. S and T.

Q 16. E is the son of A. D is the son of B. E is married to C. C is B's daughter. How is D related to E?

a. Brother b. Uncle c. Father-in-law d. Brother-in-law.



Q 17. Q's mother is sister of P and daughter of M. S is daughter of P and sister of T. How is M related to T?

a. Grandmother b. Father
c. Grandfather d. Grandfather or Grandmother.

Q 18. Deepak is brother of Ravi. Reena is sister of Atul. Ravi is son of Reena. How is Deepak related to Reena?

a. Son b. Brother
c. Nephew d. Father.

Q 19. A is father of C and D is son of B. E is brother of A. If C is sister of D, how is B related to E?

a. Daughter b. Brother-in-law
c. Husband d. Sister-in-law

Q 20. P is the brother of Q and R. S is R's mother. T is P's father. Which of the following statements cannot be definitely true?

a. T is Q's father. b. S is P's mother.
c. P is S's son. d. Q is T's son.

**Directions (Q.Nos. 21-22):** Read the following information and answer the questions given below it:

- A is the father of C. But C is not his son.
- E is the daughter of C. F is the spouse of A.
- B is the brother of C. D is the son of B.
- G is the spouse of B. H is the father of G.

Q 21. Who is the grandmother of D?

a. A b. C c. F d. H.

Q 22. Who is the son of F?

a. B b. C c. D d. E.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (a) | 2. | (c) | 3. | (d) | 4. | (b) | 5. | (b) | 6. | (d) | 7. | (d) | 8. | (b) |
| 9. | (d) | 10. | (a) | 11. | (c) | 12. | (d) | 13. | (d) | 14. | (d) | 15. | (d) | 16. | (d) |
| 17. | (d) | 18. | (a) | 19. | (d) | 20. | (d) | 21. | (c) | 22. | (a) | | | | |

# 5. Coding-Decoding Test

▸ This term is related with the message sent in secret from which can't be understo by other easily.

Coding means a method of transmitting a message between the sender and t receiver without a third person knowing it.

Decoding means the method of making out the actual message that is hidden in codi

▸ **Types of Coding-Decoding**

➤ **Letter Coding:** In this, certain letters of alphabet stand for certain other letters alphabet. For example, LOVE can be coded a MQYI where the first letter L is shift one place to M, second letter O is shifted two places to Q, third letter V is shift three places and so on. Hence, according to this pattern, the code of ANIL will b BPLP.

➤ **Number Coding:** In this type, letters are changed by the number of letters in the corresponding alphabetic positions. There can be several methods for numb coding. Some important ones are discussed below:

- **Exact Position Numbers:** *e.g.* BEE can be coded as 255.
- **Shifted Position Numbers:** *e.g.* BEE can be coded as 144. Here, the positio number of letters minus one is substituted.
- **Added Position Numbers:** *e.g.* BEE can be coded as 12. Here, the metho employed is that of adding all the position numbers.

➤ **Split by Half Coding:** In this case, the 26 letters of alphabet are split in two group in the following manner:

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

Now, A can be coded as Z, B can be coded Y, C can be coded as X and so on.

*e.g.* AFRAID can be coded as ZUIZRW.

For helping the candidates, the questions are classified into the following types:

▸ **Type 1. Letter Coding:** In this type, the letters in a word are replaced by certain other letters according to a specific rule to form its code, candidate has to detect this rule.

▸ **Coding by Shifting Letters**

**Form 1 : Forward Sequence Pattern**

**Ex. 1** If 'QUIZ' is coded as 'RVJA', how will you code 'CLASS'?

(a) DMBIT (b) DMBTT (c) DNTIB (d) DVZTT

**Sol.** (b) Q becomes R, U becomes V, I becomes J, Z becomes A. Here, each letter is coded by the next in alphabetic sequence, with the 1st letter of the alphabet 'Z' becoming the first 'A'. Therefore, 'CLASS' will be coded 'DMBTT'.



**Form 2 : Backward Sequence Pattern**

**Ex. 2** If 'DATE' is coded as 'WZGV', how will you code 'COME'?

(a) XLNV (b) XNLV (c) XVNL (d) XZSU

**Sol.** (a) Here, the coding is done in backward alphabetic order, *i.e.* A is coded as Z, B as X, C as W, and so on. The numbered alphabet will help to identify the pattern in such questions.

**Form 3 : Skipped Sequence Pattern**

**Ex. 3** If 'ACT' is coded as 'DFW', how will you code 'BAD'?

(a) DEG (b) EDG (c) GFC (d) EDF

**Sol.** (b) Use the numbered alphabet and you will see that two letters are omitted in the alphabetic sequence. 'A' (skip 2) 'D'; 'C' (skip 2) 'F'; (skip 2) 'W'; and so on schemes of such coding can be of several types, with different numbers or letters skipped.

**Ex. 4** If 'HEALTH' is written as G S K Z D G, then how will NORTH be written in that code?

(a) OPSUI (b) GSQNM (c) FRPML (d) IUSPO

**Sol.** (b) Clearly, the letters of the given word are written in reverse order, and then each letter is moved one step backward to obtain the code. Reversing the order of letters in NORTH, we get HTRON. Thus, we have

| H | T | R | O | N |
|---|---|---|---|---|
| −1↓ | −1↓ | −1↓ | −1↓ | −1↓ |
| G | S | Q | N | M |

So, that required code is GSQNM. Hence, the answer is (b).

▸ **Type 2. Direct Letter Coding:** In this coding, the code letters occur in the same sequence as the corresponding letters occur in the words. Here, either the particular codes of letters are given or the codes of two or more words are given and candidate has to find the code of given words.

**Ex. 5** If in a certain code O is written as E, A as C,M as I, S as O, N as P, E as M, I as A, P as N and C as S, then how will COMPANIES be written in that code?

(a) SMINCPAMO (b) SEIACPAMO (c) SEIACPMOA (d) None of these

**Sol.** (d) Substituting the letters of the given word with their respective code, we have:

| C | O | M | P | A | N | I | E | S |
|---|---|---|---|---|---|---|---|---|
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| S | E | I | N | C | P | A | M | O |

Hence, the answer is (d).

▸ **Type 3. Number/Symbol Coding:** In this type, either numerical code values are assig to a word or alphabetical code letter are assigned to the numbers. The candida required to analyses the code.

**Ex. 6** If RED is coded as 6720, then how would GREEN be coded?

(a) 1677199 (b) 1677209 (c) 16717209 (d) 9207716

**Sol.** (b) Clearly, the order of letters in the word is reversed and then each lett replaced by the numeral denoting its position is the English alphabet. Next, added to each number and the numbers so obtained are joined together to the code. Thus,

RED → DER → 4/5/18 → 6/7/20 → 6 7 2 0 GREEN → NEERG

→ 14/5/5/18/7/ →16/7/7/20/9 → 1677209

Hence, the answer is (b).

▸ **Type 4. Substitution:** In this type, some particular words are assigned substitut names. Then, question is to be answered in the substituted coded language.

**Ex. 7** If 'diamond' is called 'gold','gold' is called 'silver' 'silver' is called 'ruby' a 'ruby' is called 'emerald' which is the cheapest jewel?

(a) Diamond (b) Silver (c) Gold (d) Ruby

**Sol:** (d) We know that silver is cheapest. But as given, silver is called 'ruby'. So, ru is the cheapest.

Hence, the answer is (d).

▸ **Type 5. Deciphering Message Word Codes:** In this type, some messages are given the coded language and the code for a particular word or message is asked. Here, a two messages bearing a common word are picked up.

**Ex. 8** In a certain language, 'sun shines brightly', is written as 'ba lo sul', 'houses a brightly light as 'kado ula are ba' and 'light comes from sun' as 'dopi kup lo nr What code words are written for 'Sun' and 'brightly'?

(a) ba, sul (b) sul, lo (c) lo, ba (d) ba, lo

**Sol.** (c) In the 1st and 3rd statements, the common word is 'Sun' and the commo code word is 'lo'. So, 'lo' is the code for 'Sun'.

In the 1st and 2nd statements, the common word is 'brightly' and the commo code word is 'ba'. So, 'ba' is the code for 'brightly'.

Hence, the answer is (c).

▸ **Type 6. Deciphering Number and Symbol Code for Messages:** In this type, a fe groups of numbers/symbols each coding a certain message are given. The candidat has to find the number/symbol code for each word.

**Ex. 9** In a certain code language, '123' means 'bright little boy', '145' means 'ta big boy' and '637' means beautiful little flower'. Which digit in that languag means 'bright'?

(a) 1 (b) 2 (c) 3 (d) 4



**Sol.** (b) In the 1st and 2nd statements, the common code digit is '1' and the common word is 'boy'. So '1'means 'boy'.

In the 1st and 3rd statements, the common code digit is '3' and the common word is 'little'. So, '3' means 'little' thus, '2' means 'bright'.

Hence, the answer is (b).

## Multiple Choice Questions ▼

**Q 1. If FISH is written as EHRG in a certain code, how would JUNGLE be written in that code?**

a. ITMFKD b. ITNFKD c. KVOHMF d. TIMFKD.

**Q 2. In a certain code, TWINKLE is written as SVHOJKD, then how would FILTERS be written in the same code?**

a. EHKSDQR b. EHKUDQR c. EGKUDQR d. GJMSFST.

**Q 3. In a certain code, ROAD is written as URDG. How is SWAN written in that code?**

a. VXDQ b. VZDQ c. VZCP d. UXDQ.

**Q 4. In a certain code, BELIEF is written as AFKKDI. How is SELDOM written in that code?**

a. RDKCNL b. RFKENM c. RFKFNP d. TFKENP.

**Q 5. If TRUTH is coded as SUQSTVSUGI, then the code for FALSE will be:**

a. EGZBKMRDE b. EGZKMRTDF c. EGZBKMRTDF d. FGZBKNRTDF.

**Q 6. In a certain code, SPRING is written as UNUFRC. How will the word MOBILE be written in that code language?**

a. KQEFPA b. OMDGNC c. OMDGPA d. OMEFPA.

**Q 7. If SUMMER is coded as RUNNER, the code for WINTER will be:**

a. SUITER b. VIOUER c. WALKER d. SUFFER.

**Q 8. In a certain code, PRODUCTIONS is written as QQPCVEUHPMT. How is ORIENTATION written in that code?**

a. PQJDOVBSJNO b. PQJDOUBUJPO c. PSJFOVBSJNO d. NSHFMVBSJNO.

**Q 9. If, in a code, MIND becomes KGLB and ARGUE becomes YPESC, then what will DIAGRAM be in that code?**

a. BGYEPYK b. BGYPYEK c. GLPEYKB d. LKBGYPK.

**Q 10. If ROBUST is coded as QNATRS in a certain language, which word would be coded as ZXCMP?**

a. BZEOR b. AYDNQ c. AWDLQ d. YYBNO.

**Q 11. If EHFNRQ is the code for BECKON, which word has the code QDFWXULQ?**

a. NCAUTIRN b. NACUTIRN c. NATCRIUN d. NACTURIN.

**Q 12. In a certain code, REFRIGERATOR is coded as ROTAREGIRFER. Which wo would be coded as NOITINUMMA?**

a. ANMOMIUTNI b. AMNTOMUIIN
c. AMMUNITION d. NMMUNITIOA.

**Q 13. If in a certain language, GRASP is coded as BMVNK, which word would coded as CRANE?**

a. FUDQH b. HWFSJ c. GVERI d. XMVIZ.

**Q 14. If in a certain code, COVET is written as FRYHW, which word would be writt as SHDUO?**

a. QUAKE b. REPAY c. STINK d. PEARL.

**Q 15. If, in a certain language, TRIANGLE is coded as SQHZMFKD, which word wou be coded as DWZLOKD?**

a. EXAMPLE b. FIGMENT c. DISMISS d. DISJOIN.

**Q 16. In a certain code, FIRE is written as QHOE and MOVE as ZMWE. Following t same rule of coding, what should be the code for the word OVER?**

a. MWED b. MWEO c. MWOE d. MWZO.

**Q 17. In a particular way of coding, the word CENTRAL is coded as ABCDEFG ar PLANETARIUM as HGFCBDFEIJK. With the same coding, how can we expre the word LANTERN?**

a. GFCDFEG b. GFCDEFG c. GFCDBEC d. GFCDBEB.

**Q 18. In a code language, TUTORIAL is written as DODNGLCF and DANCE is writte as YCJMZ, how can EDUCATION be written in that code?**

a. ZYMODCLNJ b. ZYOMCDLNJ
c. ZYOMDCLNJ d. ZYOTNLCMD.

**Q 19. In a coding system, SHEEP is written as GAXXR and BLEAT as HPXTN. How ca SLATE be written in this coding system?**

a. GPTNX b. GPTXN c. GPXNT d. PTGXN.

**Q 20. In a coding system, PEN is written as NZO and BARK as CTSL. How can w write PRANK in that coding system?**

a. CSTZN b. NSTOL c. NTSLO d. NZTOL.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (a) | **2.** | (b) | **3.** | (b) | **4.** | (c) | **5.** | (c) | **6.** | (d) | **7.** | (b) | **8.** | (a) |
| **9.** | (a) | **10.** | (b) | **11.** | (d) | **12.** | (c) | **13.** | (b) | **14.** | (d) | **15.** | (a) | **16.** | (b) |
| **17.** | (c) | **18.** | (c) | **19.** | (a) | **20.** | (b). | | | | | | | | |



# 6. Inequality

When a group of elements are given with a certain coded relationship denoted by <, >, = ≤ or ≥, such type of questions fall under the category of reasoning Inequality.

To make the concept even more understandable, refer to the table given below:

| Reasoning Inequality – Symbol & Inference | |
|---|---|
| **Symbol** | **Inference** |
| X > Y | X is greater than Y |
| X < Y | X is less than Y |
| X < ≠ Y | X is neither greater than nor equal to Y |
| X ≤ Y | X is smaller than or equal to Y |
| X ≥ Y | X is greater than or equal to Y |

▸ Once a candidate understands the meaning of each of the symbols mentioned above, answering questions based on reasoning inequality shall become easier.

Another critical aspect that a candidate must know concerning the Inequality in reasoning is the order or the rank of these symbols.

a. If in a question, **P > Q ≥ R** is given, the greater-than sign (>) will be of the highest order and **P > R and not P ≥ R.**

b. If in a question, **P ≥ R = Q** is given, in that case, **P > Q or P = Q.**

c. If in a question, **P < Q < R** is given, then P < R.

d. If in a question, **P < Q > R** is given, the **no relation** can be found between the terms.

▸ Similar conclusions can be drawn for other questions based on inequalities.

▸ **Types of Questions in Inequality**

The questions based on inequality have to be solved with the help of cracking the coding relationship between the given elements but to make the questions more complex, a new pattern for reasoning inequality questions has come up.

Given below are the two patterns in which the Inequality questions in reasoning are asked:

▸ **Direct Questions :** In direct questions, the candidates are given the elements and the relationship between them is marked with the help of the signs, <, >, =, etc. **For example A > B = C ≤ D.**

▸ **Coded Questions :** The new format of inequality questions which is now being asked in all major exams is that they denote each sign with a symbol. **For example, they may give "A@B, where @ means that A is neither greater than nor equal to B".** In this case, the "< ≠" sign has been denoted with the "@" sign. This pattern is now being followed for all major Government exams to make the questions complex and confusing.

### ▸ Tips and Tricks to Solve Questions on Inequality

Every aspirant preparing for the competitive exams knows the value of management to qualify any of these exams. So, any small tip or trick which can you save some time in the final examination must be used to answer the questions Given below are such tips to help you answer the questions on Inequality and ace reasoning ability section:

a. To answer any inequality question, the most important thing is to be aware of signs and their representation. Only then can you answer the questions with making errors.

b. If the statements given comprise a single element more than once, try to comb the statement so that no element is repeated. For example, "A > B > C, F < C, A = all are a part of a single statement, so you can combine them to form, "E = A > C > F".

c. At no point should you change the sign between two given elements. However, can write H > E or E < H as both denote the same.

d. For coded inequalities, make sure that you make a table or any other diagram wh mentions what sigh each code represents. This will save you some time as you sh not have to read the question again and again and spend time on it.

### ▸ Solved Examples on Inequality

As stated above also, the more a person practices, the more likely is that he/she m solve the questions correctly and more efficiently. Discussed below are a few questio on both direct and coded reasoning inequalities to simplify the concept even furth for the candidates.

**Directions (Q. Nos. 1-2 ):** Answer the following questions based on the stateme given below:

**Statement: P < S < R < T > Q**

**Ex. 1** Which of the given conclusions is incorrect based on the given statement?

(a) P < R (b) S < T

(c) No relation between P & Q (d) No relation between P & T

(e) P < T

**Ans.** (c) No relation between P & Q

**Ex. 2** Which sign should be filled in the blank for the conclusion given below?

**Conclusion: P ___ T**

(a) > (b) <

(c) = (d) ≤

(e) ≥

**Ans.** (b) < ; P < T



**Directions (Q. Nos. 3-4 ):** Based on the statements, answer the following questions.

'P * Z' means P is neither greater nor smaller than Z

'P # Z' means P is neither greater than nor equal to Z

'P & Z' means P is neither smaller than nor equal to Z

'P + Z' means P is not smaller than Z

'P % Z' means P is not greater than Z

**Ex. 3** For the statement given below, which of the following options is correct?

Statement: A # C * F & R % T

(a) A & C (b) F # T (c) C * R (d) A % T

(e) C # F

**Sol.** (e) C # F

| Symbol | * | # | & | + | % |
|---|---|---|---|---|---|
| Sign | = | < | > | ≥ | ≤ |

Statement: A # C * F & R % T

Conclusion: A < C = F > R ≤ T

A & C ↔ A > C

F # T ↔ F < T

C * R ↔ C = R

A % T ↔ A ≤ T

C # F ↔ C > R

And only C > R is correct based on the given equation

**Ex. 4** To prove that A > B in the given statement, which code should be filled in the blank?

Statement: C & B ____ F * E # A

(a) # (b) * (c) & (d) +

(e) %

**Sol.** (e) %

| Symbol | * | # | & | + | % |
|---|---|---|---|---|---|
| Sign | = | < | > | ≥ | ≤ |

C & B ____ F * E # A

When % is placed in the blank, the statement becomes,

C & B % F * E # A

⇒ C > B ≤ F = E < A, which proves that A > B

The above-mentioned questions are just to give the candidates an idea as to how the questions are asked in the examination.

## Multiple Choice Questions

**Directions (Q. Nos. 1-5 ):** In each of the given questions, one statement has t given followed by two conclusions. Find which of the given conclusions is true.

**Q 1. Statement: A > F ≤ C = D < E**
**Conclusion I: A > E**
**Conclusion II: F < E**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 2. Statement: P > Q, X ≤ R < S, S > P**
**Conclusion I: P ≤ R**
**Conclusion II: X > S**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 3. Statement: V ≤ X > Y ≤ U = Z > O**
**Conclusion I: Y < Z**
**Conclusion II: Y = Z**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 4. Statement: C = B ≥ A ≤ D = E**
**Conclusion I: C = X**
**Conclusion II: C < D**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 5. Statement: L > M, M ≤ O = N, L = Q < K**
**Conclusion I: K > M**
**Conclusion II: O ≤ K**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Directions (Q.Nos. 6-10):** In the following questions, the symbols #, *, %, @ and © a used with the following meaning:

**A # B, means A is greater than B**
**A * B, means A is smaller than B**
**A % B, means A is equal to B**
**A @ B, means A is greater than equal to B**
**A © B, means A is smaller than equal to B**



**Q 6. Statement: S © P @ Q # R**
**Conclusion I: S @ R**
**Conclusion II: R * P**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 7. Statement: X # B * N @ I © H**
**Conclusion I: X # N**
**Conclusion II: I % X**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 8. Statement: A % R © U @ D % G**
**Conclusion I: A % U**
**Conclusion II: A * U**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 9. Statement: H % J * D * K # I % F**
**Conclusion I: J * K**
**Conclusion II: D % F**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 10. Statement: L # H % J % B @ D # F**
**Conclusion I: H % F**
**Conclusion II: L # D**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Q 11. Statement: K < H > G, G ≤ N, N = U**
**Conclusion I: K = U**
**Conclusion II: H > N**
a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

Q 12. **Statement: G ≤ S, S > R < K, K ≥ C, L = G**

**Conclusion I: G ≤ R**

**Conclusion II: L ≥ K**

a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

**Directions (Q.Nos. 13-15):** Based on the information given below, answer the following questions:

**A @ B, means B is greater than A**

**A & B, means B is smaller than A**

**A $ B, means B is equal to A**

**A # B, means B is greater than equal to A**

**A % B, means B is smaller than or equal to A**

Q 13. **Statement: P @ Q $ R % S # T % U**

**Conclusion I: P % U**

**Conclusion II: R @ T**

a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

Q 14. **Statement: A @ B $ C & D @ E # F**

**Conclusion I: F @ C**

**Conclusion II: A # D**

a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

Q 15. **Statement: S % U @ T & V $ W # R**

**Conclusion I: U & R**

**Conclusion II: T & W**

a. Only conclusion I is true
b. Only conclusion II is true
c. Both conclusion I and II are true
d. Neither conclusion I nor II is true
e. Either conclusion I or II is true.

## ANSWERS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (d) | **3.** | (e) | **4.** | (d) | **5.** | (a) | **6.** | (b) | **7.** | (d) | **8.** (e) |
| **9.** | (a) | **10.** | (b) | **11.** | (d) | **12.** | (d) | **13.** | (d) | **14.** | (d) | **15.** | (b). | |



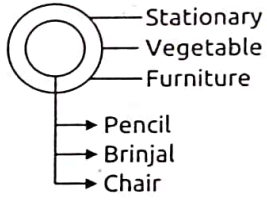
# 7. Logical Venn Diagram Test

▸ The term Venn Diagram in Test of Reasoning relates to the different figures drawn to represent relationship between two or more objects. Generally, the figures used for such representation are circular but sometimes square, triangle and rectangle are used in place of circle. These questions are meant to test analytical ability of a candidate to represent and classify a given group of objects diagrammatically.

A basic concept of set, subset, disjoint set can help to understand the concept of venn diagram easily:

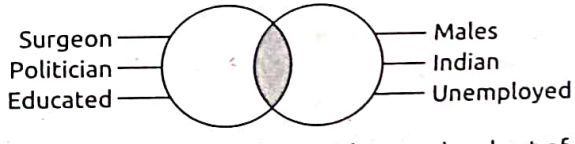
1. An object is called a subset of another object, if former is a part of latter and such relation is shown by two concentric circles.
   (i) Pencil, Stationary
   (ii) Brinjal, Vegetable
   (iii) Chair, Furniture

It is very clear from the above relationship that one object is a part of other, and hence all such relationships can be represented by the following figure:




2. An object is said to have an intersection with another object, when two objects share something in common.
   (i) Surgeon, Males
   (ii) Politician, Indian
   (iii) Educated, Unemployed

All the three relationships given above have something in common as some surgeons can be male and some female, some politicians may be Indian and some may belong to other countries, educated may be employed and unemployed as well. And all the three relationships can be represented by the following figure:



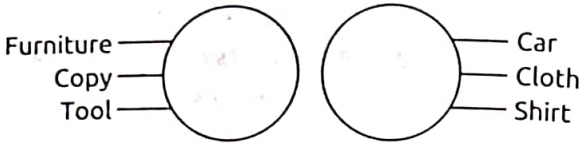

3. Two objects are said to be disjoint when neither one is subset of another nor they share anything in common. In other words, totally unrelated objects fall under this type of relationship.

(i) Furniture, Car

(ii) Copy, Cloth

(iii) Tool, Shirt

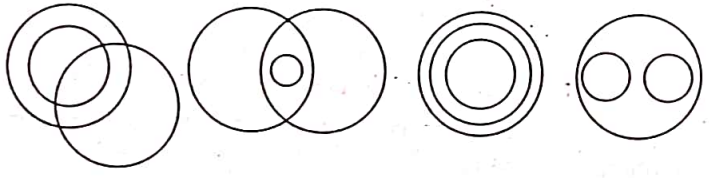
▸ It is clear from the above relationship that both the objects are unrelated to each other and hence can be represented diagrammatically as shown in the following figure:




▸ From the above discussion, we observe that representation of relationship of two objects is not typical if students follow the above points. But representation of three objects diagrammatically pose slight problem before the students. A variety of such relationship is being discussed in the following examples.

▸ **Type 1:** In this type of questions, geometrical figures are given that represent different classes. These different classes share some common relationship.

**Directions (Q. Nos. 1-3) :** Each question below has three items having certain relationship among them. The same relationship is expressed by sets of circles, each circle representing one item irrespective of its size. Match the items with right set of circles.



(A) (B) (C) (D)

**Ex. 1** Rivers, Canals, Perennial source of water:

(a) A (b) B (c) C (d) D

**Ans.** (d) D

**Ex. 2** Rings, Ornaments, Diamond rings:

(a) C (b) B (c) A (d) D

**Ans.** (a) C

**Ex. 3** Women, Married persons, Wives who work:

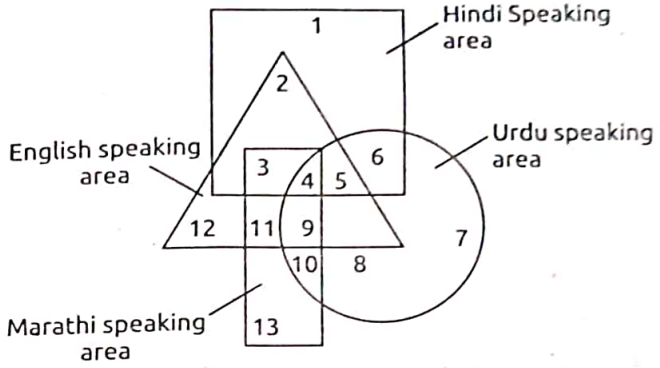
(a) A (b) C (c) D (d) B

**Ans.** (d) B

▸ **Type 2:** In this type, geometrical figures are given such that the numbers present in figures represent different areas. Candidate has to analyse the area representing the number.



**Directions (Q. Nos. 4-6):** The figure given below depicts an area where people speak four languages. The triangle depicts English speaking area, the square Hindi speaking area, the circle stands for Urdu speaking area and the rectangle for area where people speak Marathi. Each part is numbered. Your task is to study the figure and answer the questions that follow:




**Ex. 4** Which number depicts English, Urdu and Marathi speaking areas?

(a) 41 (b) 11

(c) 9 (d) 8

**Ans.** (c) 9

**Ex. 5** Number 2 depicts:

(a) English and Hindi speaking areas (b) Only English speaking areas

(c) Hindi and Marathi speaking areas (d) English and Marathi speaking areas

**Ans.** (a) English and Hindi speaking areas

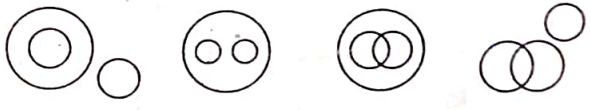
**Ex. 6** Which number depicts Marathi, English and Hindi speaking areas ?

(a) 4 (b) 5 (c) 9 (d) 3

**Ans.** (d) 3

## Multiple Choice Questions ▾

**Directions (Q. Nos. 1-8) :** Each question below contains three groups of things. You are to choose from the following diagrams, the diagram that depicts the correct relationship among the three groups of things in each question.



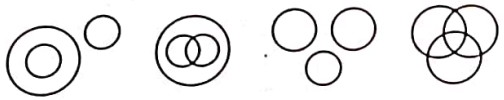
a. b. c. d.

**Q 1. Protons, Electrons, Atoms**

**Q 2. Paper, Stationary, Ink**

**Q 3. Dog, Animal, Pet**
**Q 4. Wheat, Grains, Maize**
**Q 5. Science, Physics, Chemistry**
**Q 6. Dog, Carnivore, Tiger**
**Q 7. Atmosphere, Hydrogen, Oxygen**
**Q 8. River, Canal, Perennial sources of water**

**Directions (Q.Nos. 9-13):** Choose the Venn diagram which best illustrates the three given classes in each question:

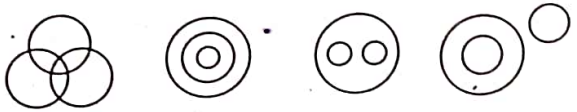


a. b. c. d.

**Q 9. Machine, Lathe, Mathematics**
**Q 10. Citizens, Educated, Men**
**Q 11. Sun, Moon, Stars**
**Q 12. Honesty, Intelligence, Aptitude**
**Q 13. Animals, Men, Plants**

**Directions (Q.Nos. 14-23):** In each of these questions, three words are related in some way. The relationship among the words in the question can best be represented by the diagrams given below.

Mark your answer accordingly.



a. b. c. d.

**Q 14. Cabinet, Home Minister, Minister**
**Q 15. Professor, Researcher, Scientist**
**Q 16. Men, Rodents, Living beings**
**Q 17. Parrots, Birds, Mice**
**Q 18. Parents, Mother, Father**
**Q 19. Nitrogen, Ice, Air**
**Q 20. Musicians, Singers, Women**
**Q 21. Fish, Herring, Animals living in water**
**Q 22. Elephant, Carnivore, Tiger**
**Q 23. Hospital, Nurse, Patient**

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (b) | **3.** | (c) | **4.** | (b) | **5.** | (b) | **6.** | (b) | **7.** | (b) | **8.** | (a) |
| **9.** | (a) | **10.** | (b) | **11.** | (a) | **12.** | (c) | **13.** | (a) | **14.** | (b) | **15.** | (a) | **16.** | (c) |
| **17.** | (d) | **18.** | (c) | **19.** | (d) | **20.** | (a) | **21.** | (b) | **22.** | (d) | **23.** | (c). | | |



# 8. Sitting Arrangement

▸ Sitting arrangement is a sequential arrangement of objects/persons on the basis of predefined conditions.

In this chapter, we deal with the questions based on sitting arrangement of persons or objects. In this type of questions, some conditions are given, on the basis of which candidates are required to arrange objects/person, either in a row or in a circular order or in any other geometrical shape. While making arrangements, it should be noted that all the conditions given are compiled with.

▸ **Types of Questions**

There are three types of questions, which are generally asked in various competitive examinations.

▸ **Type 1**

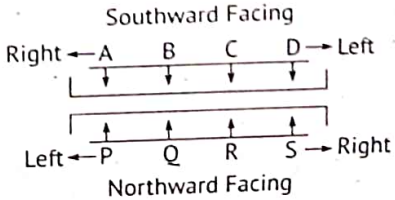
**Arrangement in Linear Pattern**

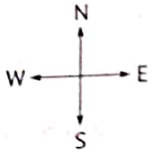
Here, we deal with questions, where a proper arrangement is required to be done in a linear format along a straight line.

Before solving this type of questions, it is necessary to know the given facts:

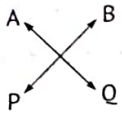
▸ When it is not given in the questions that in which direction the person(s) is facing, then we assume it facing the North direction.

▸ When A, B, C and D are facing in South direction and P, Q, R and S are facing in North direction in a line, then positions to their right and left will be




▸ When A, B are in one line and P, Q in other, then diagonally opposite directions will be

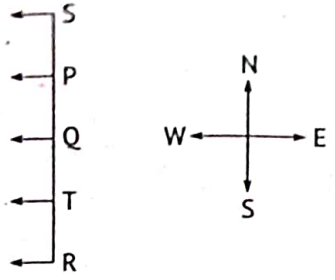



A is diagonally opposite to Q and B is a diagonally opposite to P.

**Ex. 1** P, Q, R, S and T are sitting in a line facing West. P and Q are sitting together. R is sitting at South end and S is sitting at North end. T is neighbour of Q and R. Who is sitting in the middle?

(a) P
(b) Q
(c) R
(d) S.

**Sol.** (b) According to the given information, the sitting arrangement is as giv below:




Clearly, from the above diagram, Q is sitting in the middle.

**Directions (Ex. 2-5):** Study the following information carefully and answer th questions given below:

There are ten persons are sitting in two parallel row such that five persons a sitting in each row. A, B, C, D and E are sitting in row 1 and faces North and N, O, P and R are sitting in row 2 and faces South such that persons sitting row 1 faces the persons sitting row 2.

B sits immediate right of A. Neither A nor B sits at the extreme ends. Tw persons sits between P and N. B faces the one who sits on the immediate le of P. M sits on the immediate right of R. C sits at the end of the row. D sits the left of E. D does not faces R.

**Ex. 2** Four of the following five belongs to a group, find the one that does n belongs to that group?

(a) O (b) C (c) D (d) P

(e) N.

**Ex. 3** Who among the following sits second to the left of the one who faces B?

(a) R (b) N (c) O (d) M

(e) None of the above.

**Ex. 4** How many persons sits on the left of N?

(a) One (b) Two (c) No one (d) Three

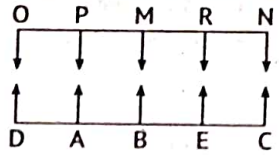
(e) None of the above.

**Ex. 5** How many persons sits between D and C?

(a) One (b) Two (c) Three (d) No one

(e) Cannot be determined.

**Sol.** (Ex. 2-5) The sitting arrangement is as follows:






2. (d) Except P, all are at the end of row.
3. (b) M faces B and N is second to the left of M.
4. (c) No one sits on the left of N.
5. (c) Three persons sit between D and C.

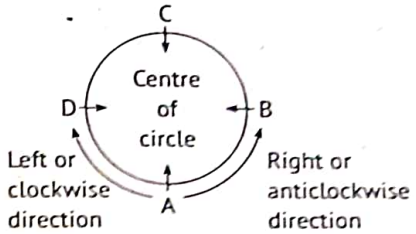
▸ **Type 2**

**Circular Arrangement**

In circular arrangement, persons/objects are arranged around a circle facing towards or outside the centre on the basis of information provided.

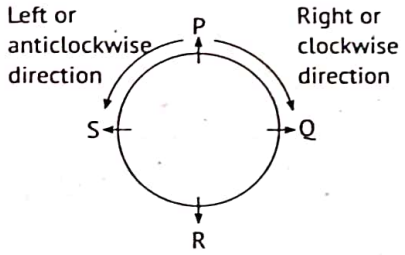
**Facing Towards the Centre**

Suppose A, B, C and D are four persons facing towards the centre, then their right and left sides are shown by the arrows in the given diagram. B is on the right side of A and D is on the left side of A.




**Facing Outside the Centre**

Suppose there are four persons P, Q, R and S. All the persons are facing outside the centre, then their left and right sides are shown in the diagram by arrows. Q is on the right of P and S is on the left of P.




**Note:** When it is not given in the question that in which direction the persons are facing, then we assume it facing the centre.

**Directions** (Ex. 6-8 ): Study the following information carefully and answer the given questions:

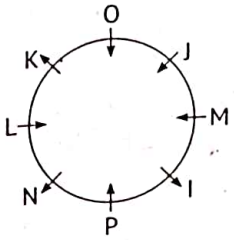
Eight persons I, J, K, L, M, N, O and P are sitting around a circular table but not necessarily in the same order. Three of them are facing outwards while five are facing towards the centre. M is third to the right of K. N is sitting third to the left of M. Three persons are sitting between N and J. O is sitting third to the right of N, who is not facing the centre. L is sitting third to the right of I, who is not facing the centre.

**Ex. 6** Who sits between N and I?
(a) J (b) K (c) M (d) O
(e) None of the above.

**Ex. 7** Who among the following is second to the right of J?
(a) L (b) K (c) M (d) N
(e) None of the above.

**Ex. 8** Which of the following statements is/are true with respect to P?
(a) P is opposite of O (b) P is fourth to the right of O
(c) P is fourth to the left of O (d) All are true
(e) None of the above.

**Sol.** (Ex. 6-8) According to the given information the final arrangement of eigh persons around a circular table is shown below:




6. (e) P is sitting between N and I.
7. (b) K is sitting second to right of J.
8. (d) All statements are true with respect to P.

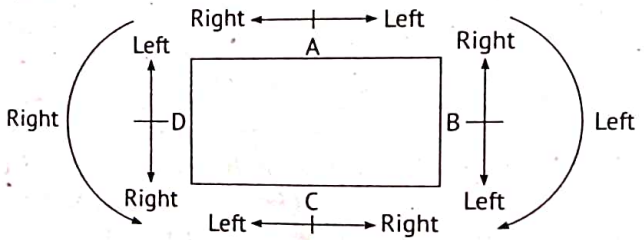
▸ **Type 3**

**Arrangement in Other Geometrical Shapes**

In this type, questions are asked to arrange the persons in square, rectangle, pentagon hexagon or any other geometrical shape.

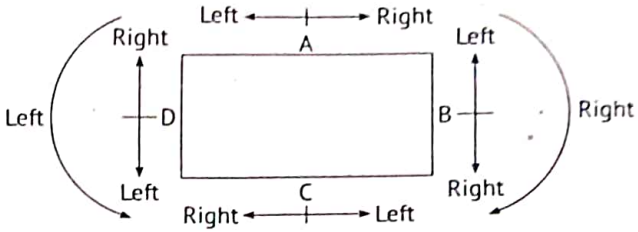
**1. Square/Rectangular Arrangement**

In this type of arrangement, objects/persons are placed around a rectangular or square shaped table facing either at the centre or the direction opposite to centre. The left and right of each persons in both the cases can be understood with the help of following diagrams:




**Facing the centre**

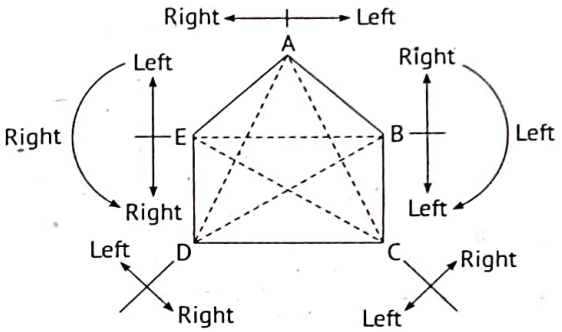




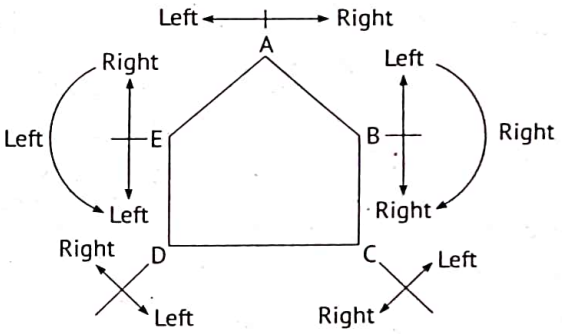

**Facing the direction opposite to centre**

**2. Pentagonal Arrangement**

In this arrangement, persons/objects are placed around a pentagonal plane facing either at the centre or the direction opposite to the centre. The left and right of each person in both the cases can be understood with the help of the following diagrams:



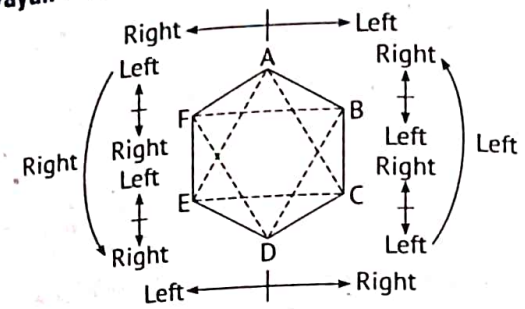

**Facing the centre**



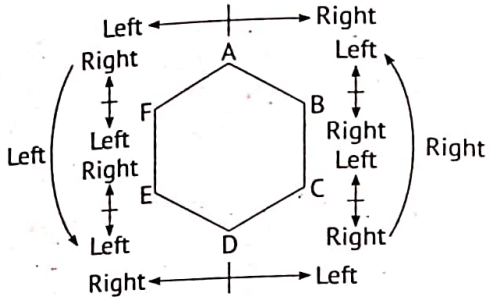

**Facing the direction opposite to centre**

**3. Hexagonal Arrangement**

In this arrangement, objects/persons are placed around a hexagonal plane facing either at the centre or the direction opposite to centre. The left and right of each persons/ object in both the cases can be understood with the help of following diagrams:



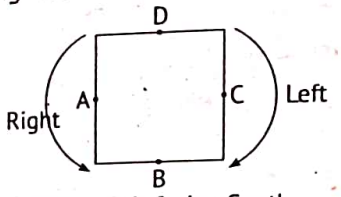

**Facing the centre**

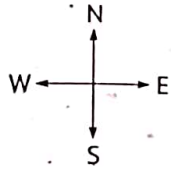



**Facing the direction opposite to centre**

**Ex. 9** A, B, C and D are playing cards on a square table. A and C and B and D a partners. D is to the right of C. The face of C is towards West. Find the direct that D is facing:
(a) West (b) East (c) South (d) North.

**Sol.** (c) Arrangement according to the question is as follows:

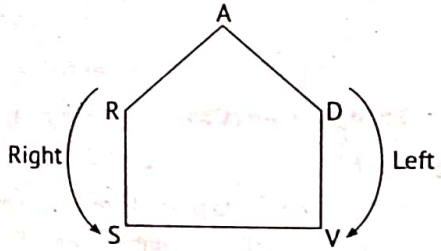



Clearly, D is facing South.

**Ex. 10** 5 girls A, R, D, S and V are sitting around a pentagonal table. A is between R ar D. S is to the left of V. R is to the left of S. Who is to the right of A?
(a) S (b) D (c) R (d) V.

**Sol.** (c) Arrangement according to the question is as follows:




Clearly, R is to the right of A.



## Multiple Choice Questions ▼

**Q 1. Amit, Gaurav, Hatim, Varun, Yukti and Zaid are sitting in a straight line, all facing the North. Gaurav is fourth to the left of Amit. Yukti is sitting at one corner. Hatim is fourth to the left of Yukti. Zaid is third to the right of Gaurav. Who is sitting at he second place to the left of Zaid?**

a. Varun b. Yukti
c. Hatim d. Amit.

**Q 2. Eight people E, H, M, P, S, T, Y and Z are sitting in a straight line. All of them are facing North. E sits fourth from one of the extreme ends of the line. H sits third to the right of E. As many people sit to the right of H as to the left of M. Only one person sits between M and P. S sits to the immediate right of Z. Only one persons sits between Z and T.**

a. two b. three
c. one d. none of these.

**Q 3. Six persons, P, A, V, K, J and C are sitting in a row facing North. C is to the immediate left of V who is third to the right of P. J is to the immediate left of K and is at one of the end. Who is to the immediate left of A?**

a. C b. P
c. K d. J.

**Q 4. 6 boys P, Q, R, S, T and U are standing in a row facing North. P and Q cannot be either at 1st or 2nd place. R and S will always be together and R must be at one of the ends. R doesn't have S to his right. Who is standing on the West end?**

a. S b. S or U
c. T d. T or U.

**Q 5. Pratik, Esha, Rashmi, Sakshi and Trisha are sitting on a bench facing North. Trisha and Esha are siting together, Trisha and Rashmi are sitting together, Pratik is one the extreme left, Esha is second from extreme right. Who is sitting between Pratik and Esha?**

a. Rashmi and Trisha b. Rashmi and Sakshi
c. Esha and Trisha d. Trisha and Sakshi.

**Q 6. Five friends Roma, Ketaki, Devi, Shanaya and Urmi are sitting in a line facing North. Ketaki is sitting to the immediate left of Shanaya. Roma is sitting to the immediate right of Urmi. Devi is sitting between Roma and Ketaki. Which two persons are sitting at the corners?**

a. Ketaki and Roma b. Ketaki and Shanaya
c. Urmi and Roma d. Urmi and Shanaya.

Q 7. Five girls Beena, Leena, Meena, Reena and Teena are playing game. They ar sitting in a row facing towards the North. Meena is sitting at the West end an Teena is sitting at the East end. Leena and Reena are sitting together next t each other. Beena is sitting to the left of Leena and to the right of Meena. Wh is sitting second from the East end?

a. Leena b. Reena c. Teena d. Beena.

Q 8. Five students are sitting in a row. Sunil is neither a neighbour of Aastha no Shyam, Aastha is a neighbour of Shyam and she is on the left end of the row Sunil is a neighbour of Manjeet, Manjeet is exactly in the middle of the row and is not a neighbour of Amita. Who are the neighbours of Sunil?

a. Manjeet and Amita b. Shyam and Amita

c. Shyam and Manjeet d. Aashta and Manjeet.

Q 9. Four friends are sitting in a row facing North. B is at one end. A is second to the right of D. If D is between B and C, which of the following statements is not true?

a. C is sitting to the immediate right of D

b. B is sitting to the immediate left of D.

c. A and B are sitting next to each other

d. A is sitting at one end.

Q 10. Ten people are sitting in two parallel rows 1 and 2. A, B, C, D and E are sitting in row I facing North and V, W, X, Y and Z are sitting in row 2 facing South in such a way that each member in row 1 face a member of row 2. A sits second from the right end of the row. W faces an immediate neighbour of A. X sits third to the right of W. The one who faces X, sits to the immediate right of B. Only one person sits between B and C. V sits to the immediate right of Y. D does not sit at any of the extreme ends of the row. Who faces Z

a. E b. C

c. D d. B.

Q 11. A group of 10 students are sitting in a row according to their age. Rohan is 6th from the beginning and his friend Shomya is 9th from the end of the row. How many students are sitting between them?

a. 3 b. 4 c. 2 d. 5.

Q 12. Six members M1, M2, M3, M4, M5 and M6 of a family are sitting in a row facing towards the North (not necessarily in the same order). M3 sits to the immediate right of M5 and second to the left of M1, M4 is second to the right of M2, M5 is not sitting at the ends of the row.

Who are sitting at the ends of the row?

a. M6 and M3 b. M6 and M1 c. M6 and M4 d. M3 and M4.



Q 13. Eight people M, N, P, S, T, V, X and Y are sitting in a straight line and all are facing North. N sits second from one of the extreme ends of the line. Only three people sit between M and N. P sits second to the right of M. As many people sit to the right of P as to the left of S. Exactly three people sit between T and S. T does not sit at any of the extreme ends of the line. Y sits to the immediate right of X. Who sits third to the left of V?

a. P b. M

c. X d. Y.

Q 14. Six houses P, Q, R, S, T and U are located in two rows with three houses in each row. The houses in both the rows face each other, P is facing T, Q is not facing U. S is between P and U. Which three houses are in the same row?

a. Q, R, T b. S, T, U

c. P, Q, R d. P, S, T.

Q 15. Six persons, Vinay, Madhav, Nilesh, Sagar, Arvind and Rajesh are standing in two rows facing towards each other such that three persons are in a rows.

1. Nilesh is between Arvind and Sagar.
2. Nilesh is not facing Vinay.
3. Madhav is facing Arvind.

What is Rajesh's position?

a. Facing towards Vinay b. Between Vinay and Madhav

c. Between Vinay and Arvind d. Facing towards Sagar.

Q 16. Eight persons A, B, C, D, E, F, G and H are sitting around a round table each facing the centre. D is second to the left of F and third to the right of H. A is second to the right of P and an immediate neighbour of H. C is second to the right of B and F is third to the right of B. G is not an immediate neighbour of F. In the above information who is to the immediate left of A?

a. H b. E

c. G d. B.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (c) | 2. | (c) | 3. | (b) | 4. | (d) | 5. | (a) | 6. | (d) | 7. | (b) | 8. | (a) |
| 9. | (c) | 10. | (d) | 11. | (a) | 12. | (c) | 13. | (d) | 14. | (a) | 15. | (b) | 16. | (b) |

# 9. Puzzle Test

▶ It is a type of Analytical Reasoning comprising of questions in the form of puzzle involving certain **number of items**, be it **persons or things**.

The questions on puzzle test may be any of the following types:

▶ **Type 1. Classification Type Questions**

This type consists of questions in which certain items belonging to different groups having different qualities are given along with some clues with the help of which the candidate is required to group and analyse the given items.

**Directions (1-2):** Study the information and answer the questions:

(i) Kailash, Govind and Harinder are intelligent.

(ii) Kailash, Rajesh and Jitendra are hardworking.

(iii) Rajesh, Harinder and Jitendra are honest.

(iv) Kailash, Govind and Jitendra are ambitious.

**Ex. 1** Which of the following persons is neither hard working nor ambitious?

(a) Kailash (b) Govind

(c) Harinder (d) Rajesh.

**Ex. 2** Which of the following person is neither honest nor hardworking but is ambitious?

(a) Kailash (b) Govind (c) Rajesh (d) Harinder.

**Sol.** A table can be prepared as:

| | Intelligent | Hard working | Honest | Ambitious |
|---|---|---|---|---|
| Kailash | ✓ | ✓ | | ✓ |
| Govind | ✓ | | | ✓ |
| Harinder | ✓ | | ✓ | |
| Rajesh | | ✓ | ✓ | |
| Jitendra | | ✓ | ✓ | |

1. (c) Harinder is neither hardworking nor ambitious.
2. (b) Govind is ambitious but neither honest nor hardworking.

▶ **Type 2. Seating/Placing Arrangements**

In this type, some clues regarding seating or placing sequence (linear or circular) of some persons or items is given. The candidate is required to form the proper sequence using these clues.

**Ex. 3** A, P, R, X, S and Z are sitting in a row. S and Z are in the centre and A and P are at the ends. R is sitting on the left of A. Then who is sitting on the right of P?

(a) A (b) S (c) X (d) Z.



**Sol.** (c) R is on the left of A *i.e.* R, A and P are at the ends *i.e.* P ..... R, A

S and Z are at the centre *i.e.* P_ S, Z, R, A

Thus, the arrangement in the row is

P, X, S, Z, R, A

Clearly, X is on the right of P.

Hence, (c) is the correct option.

**ype 3. Comparison Type Questions**

this type, clues are given regarding comparisons among a set of persons or things th respect to one or more qualities. The candidate is required to analyse the whole formation, form a proper ascending/descending sequence and answer the questions.

**Ex. 4** In a shop, there were 4 dolls of different height A, B, C and D. D is neither as tall as A nor as short as C. B is shorter than D but taller than C. If Mani wants to purchase the tallest doll, which one should she purchase?

(a) Only A (b) Only D (c) Either A or D (d) Either B or D

**Sol.** (a) D is not as tall as A $\Rightarrow$ D is shorter than A

$\Rightarrow D < A$

D is not as short as C $\Rightarrow$ D is taller than C

$\Rightarrow D > C$

B is shorter than D but taller than C

$\Rightarrow C < B < D$

Thus, we have

$C < B < D < A$

So, A is the tallest.

Hence, (a) is the correct option.

**ype 4. Sequential Order of Things**

this type, some clues are given regarding the order of occurrence of certain events. he candidate is required to analyse the given information.

**ctions (5-6):** Seven executives P, Q, R, S, T, U and W reach office in a particular uence. U reaches immediately before P but does not immediately follow S. R is the one to reach office. T follows immediately after P and is subsequently followed by W. v, answer the following questions:

**Ex. 5** Among the executives, who reaches the office first?

(a) Q (b) S

(c) U (d) Can't be determined.

**Ex. 6** Who ranks fourth in the sequence of reaching office?

(a) W (b) U

(c) T (d) None of these.

Now, U doesn't immediately follow S and R reaches last. So, the order ... office is S, Q, U, P, T, W, R.

5. (b) S is the first to reach office.

Hence, (b) is the correct option.

6. (d) P is fourth in the sequence.

Hence, (d) is the correct option.

### ▶ Type 5. Selection Based on Given Conditions

In this type, a few essential criteria for selection of a group of items are g... candidate has to keep these conditions in mind and make the required selec...

**Directions (7-8):** A team of five is to be selected from amongst five boys A, B, C ... and four girls P, Q, R and S. Some criteria for selection are

A and S have to be together.

P cannot be put with R.

D and Q cannot go together.

C and E have to be together.

R can't be put with B.

Now, answer the following questions:

**Ex. 7** If two of the members have to be boys, the team will consist of:

(a) A, B, S, P, Q (b) A, D, S, Q, R

(c) B, D, S, R, Q (d) C, E, S, P, Q.

**Ex. 8** If A and C are members, the other members of the team cannot be:

(a) B, E, S (b) D, E, S

(c) E, S, P (d) P, Q, E.

**Sol.** 7. (a) If A is selected, S has to be selected.

If B is selected, R can't be selected.

If D is selected, Q can't be selected.

So, A, D, S, Q, R and B, D, S, R, Q are wrong C, E, S, P, Q is not po... because S has to be accompanied with A.

Hence, (a) is the correct option.

8. (d) If A and C are members, S and E have also to be selected. So, P, Q, E ... the correct combination.

Hence, (d) is the correct option.

### ▶ Type 6. Family Based Puzzles

In this type, some clues are given regarding relationship among different mem... of a family, together with their professions, qualities, dresses, preferences etc... candidate is required to analyse the whole information and answer the questions



**...ions (9-11):** A family consists of six members P, Q, R, S, T and U. There are two ...d couples. Q is a doctor and the father of T. U is grandfather of R and is a contractor. ...andmother of T and is housewife. There is one doctor, one contractor, one nurse, ...ousewife and two students in the family.

**...9** Who is the husband of P?

(a) R (b) U

(c) Q (d) S.

**...10** Who is the sister of T?

(a) R (b) U

(c) T (d) Information insufficient.

**...11** What is the profession of P?

(a) Doctor (b) Nurse

(c) Doctor or Nurse (d) Housewife.

**Sol.** Q, the doctor, is the father of T, S, the housewife, is the grandmother of T, and hence the mother of Q. Since, there are only two married couples, one being that of Q, the grandfather of R *i.e.*, U must be married to S. Thus, R and T will be the children of Q and these must be the students. So, P, who remains, is the wife of Q and she alone can be the nurse. U is a contractor.

9. (c) Q is the husband of P.

Hence, (c) is the correct option.

10. (d) Clearly, R and T are children of same parents.

So, R will be the sister of T.

Hence, (d) is the correct option.

11. (b) P is the nurse.

Hence, (b) is the correct option.

### ...ype 7. Ranking Test

...n this, generally the ranks of a person both from the top and from the bottom are ...entioned and the total number of persons is asked. However, sometimes the question ... put in the form of a puzzle of interchanging seats by two persons.

**...x 12.** Kamini ranks sixteenth from the top and fifteenth from the bottom in a certain examination. How, many students are there in her class?

(a) 30 (b) 31 (c) 32 (d) 33.

**Sol.** (a) Clearly, the whole class consists of:

(i) 15 students who have a rank higher than Kamini

(ii) Kamini

(iii) 14 students who have rank lower than Kamini *i.e.* (15 +1+14) = 30. So, the answer is (a).

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-3):** Read the following information carefully and ... questions given below:

Ravi and Kunal are good in Hockey and Volleyball. Sachin and Ravi are good ... and Baseball. Gaurav and Kunal are good in Cricket and Volleyball. Sachin, ... Michael are good in Football and Baseball.

**Q 1. Who is good in Hockey, Cricket and Volleyball?**

a. Sachin b. Kunal c. Ravi d. Gaurav

**Q 2. Who is good in Baseball, Cricket, Volleyball and Football?**

a. Sachin b. Kunal c. Gaurav d. Ravi.

**Q 3. Who is good in Baseball, Volleyball and Hockey?**

a. Sachin b. Kunal c. Ravi d. Gaurav

**Q 4. Five friends A, B, C, D and E are standing in a row facing South ... necessarily in the same order. Only B is between A and E, C is immedi... to E and D is immediate left to A. On the basis of above information, ... the following statements is definitely true?**

a. B is to the left of A. b. D is third to the left of E.

c. B is to the right of E. d. A is second to the left of C.

**Q 5. In the Olympic games, the flags of six nations were flown on the mas... following way:**

**The flag of America was to the left of Indian tricolour and to the righ... flag of France. The flag of Australia was on the right of the Indian flag ... to the left of the flag of Japan, which was to the left of the flag of Chi... the two countries whose flags are in the centre.**

a. India and Australia b. America and India

c. Japan and Australia d. America and Australia.

**Directions (Q. Nos. 6-8):** Read the following information to answer the given que...

Seven children A, B, C, D, E, F and G are standing in a line. G is to the right of D ... the left of B. A is on the right of C. A and D have one child between them. E and ... two children between them. D and F have two children between them.

**Q 6. Who is on the extreme right?**

a. B b. E c. F d. G.

**Q 7. Who is exactly in the middle?**

a. A b. C c. D d. E.

**Q 8. Who is on the extreme left?**

a. A b. B c. C d. D.



**...tions (Q. Nos. 9-12):** Study the following information carefully and answer the ...tions given below:

...iends A, B, C, D, E and F are sitting in a row facing towards North. C is sitting between ...H E. D is not at the end. B is sitting immediate right to E. F is not at the right end.

**...g. How many persons are there to the right of D?**

a. One b. Two c. Three d. Four.

**...0. Which of the following pairs is sitting to one side of D?**

a. FB b. FC c. FE d. None of these.

**...1. Who is immediate left of C?**

a. A b. E

c. Either E or A d. Cannot be determined.

**...2. Who is at the right end?**

a. A b. B

c. E d. Cannot be determined.

**...ctions (Q. Nos. 13-16):** Read the following information carefully and answer the ...stions given below:

...persons A, B, C, D, E and F are sitting in two rows, three in each.

(i) E is not at the end of any row.

(ii) D is second to the left of F.

(iii) C, the neighbour of E, is sitting diagonally opposite to D.

(iv) B is the neighbour of F.

**13. Which of the following are sitting diagonally opposite to each other?**

a. F and C b. D and A c. A and C d. A and F.

**14. Which of the following are in the same row?**

a. A and E b. E and D c. C and B d. A and B.

**15. Which of the following are in one of the two rows?**

a. FBC b. CEB c. DBF d. AEF.

**16. After interchanging seat with E, who will be the neighbours of D in the new position:**

a. C and A b. F and B c. Only B d. Only A.

### Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (b) | 2. | (c) | 3. | (c) | 4. | (b) | 5. | (a) | 6. | (c) | 7. | (c) | 8. | (c) |
| 9. | (d) | 10. | (d) | 11. | (a) | 12. | (b) | 13. | (d) | 14. | (a) | 15. | (c) | 16. | (a) |

# 10. Number & Alpha-Numeric Puzzle

## ▸ Number Puzzle

In this type of questions, a set, group or series of numerals is given and cand required to trace out numerals following certain given conditions or that lie positions according to a certain given pattern.

**Ex. 1** In the series given below, how many such 8's are there each of which divisible by its immediate preceding as well as succeding numbers?

2 8 3 8 2 4 8 2 4 8 6 8 2 8 2 4 8 3 8 2 8 6

(a) One (b) Two

(c) Three (d) Four.

**Sol.** (b) We shall mark such set of 3 numbers in which the middle number each of the two numbers on both sides of it is a factor of 8 as shown:

2 8 3 8 2 [4 8 2] 4 8 6 8 [2 8 2] 4 8 3 8 2 8 6

So, there are two such 8's.

## ▸ Alpha-Numeric Puzzle

In this type of questions, a jumbled sequence of some letters, numbers and sym given followed by certain questions which may be of the following types:

(a) Finding elements which may be letters, symbols or numbers satisfying conditions in the given sequence.

(b) Determining element at a certain position in the sequence.

(c) Finding the analogical relationship between given pair of combinatio elements.

(d) Finding the odd combination from among a given set of combinatio elements.

(e) Completing a series consisting of terms that is formed by a combination o elements of the sequence by finding out the hidden pattern.

**Ex. 2** Study the following arrangement of letters, digits and symbols.

A B 7 C D 9 Z Y * P 2 M © K S 3 ↑ 5 N T @

How many such digits are there in the sequence each of which is immedi preceded as well as followed by a letter?

(a) Nil (b) One

(c) Two (d) Three.

**Sol.** (d) A B 7 C D 9 Z Y * P 2 M © K S 3 ↑ 5 N T @

So, there are three such digits.

**Q 9.** How many 8's are there in the following number series each of which is divisible by its immediately preceding and also divisible by immediately succeeding numbers?

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

a. 1 b. 2 c. 3 d. 4.

**Q 10.** In the series,

6 4 1 2 2 8 7 4 2 1 5 3 8 6 2 1 7 1 4 1 3 2 8 6

how many pairs of alternate numbers have a differ ence of 2?

a. One b. Two c. Three d. Four.

**Q 11.** A number is greater than 3 but less than 8. Also, it is greater than 6 but than 10. The number is:

a. 5 b. 6 c. 7 d. 8.

**Q 12.** How many even numbers are there in the following sequence of numbers of which is immediately followed by an odd number as well as immediately preceded by an even number?

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

a. One b. Three c. Five d. None of the

**Q 13.** How many times will you write even numerals if you write all the numbers from 291 to 300?

a. 11 b. 13 c. 15 d. 17.

**Directions (Q.Nos. 14-16):** Study the following number sequence and answer the questions given below it:

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

**Q 14.** How many even numbers are there in the sequence which are immediately preceded by an odd number but immediately followed by an even number?

a. 1 b. 2 c. 3 d. 4.

**Q 15.** How many odd numbers are there in the sequence each of which is immediately followed by an odd number?

a. 1 b. 2 c. 3 d. More than 4.

**Q 16.** How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by an even number?

a. 1 b. 2 c. 3 d. 4.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (c) | **3.** | (b) | **4.** | (b) | **5.** | (b) | **6.** | (d) | **7.** | (a) | **8.** | |
| **9.** | (d) | **10.** | (b) | **11.** | (c) | **12.** | (d) | **13.** | (b) | **14.** | (c) | **15.** | (d) | **16.** | |



# Unit-II

## 1. Syllogism Test

**Logic**

The word 'Logic' is derived from the Greek noun *'logos'* meaning both 'thought and the word representing thought'. Thus, logic is the 'science of thought as expressed in language'.

**Proposition**

In logic, any categorical statement is termed as the proposition. It is a grammatical sentence consisting of a quantifier, a subject, a predicate and a copula. It is also known as premises.

The standard form of a proposition is:

Quantifier + Subject + Copula + Predicate

Thus, the proposition consists of four parts:

**(a) Subject:** It affirms or denies a fact.

**(b) Predicate:** It states something about a subject.

**(c) Copula:** It shows relationship between subject and predicate.

**(d) Quantifier:** It determines the quantity of subject.

***e.g.*** All cups are jars

Quantifier — Subject — Copula — Predicate

**Types of Proposition**

Proposition can mainly be divided into three categories:

**(a) Categorical proposition**—In categorical proposition, there exists a relationship between subject and a predicate without any condition. It means predicate is either affirmation or denial of the subject unconditionally.

***e.g.*** (i) All cups are plates.
(ii) No girl is boy.

**(b) Hypothetical proposition**—In this proposition, relationship between subject and predicate is asserted conditionally.

***e.g.*** (i) If it rains, he will not come.
(ii) If he comes, I will accompany him.

**(c) Disjunctive proposition**—In this proposition, the assertion is of alteration.

***e.g.*** (i) Either he is honest or he is loyal.
(ii) Either he is educated or he is illiterate.

**Types of Inferences**

Inferences drawn from statements can be of two types :

**(a) Immediate Inference**—When inference is drawn from a single statement i.e. only one given proposition, then inference is known as immediate inference.

**Example:**

**Statement:** All books are pages.

**Conclusion:** Some pages are books.

In the above example, conclusion is drawn from a single statement and doesn't
the second statement to be referred, hence the inference is called an imm
inference.

**(b) Mediate Inference**—In mediate inference, conclusion is drawn from tw
statements which are combined through a common term.

**Example:**

**Statement**: All dogs are cats.
All cats are black.

**Conclusion**: All dogs are black.

In the above example, conclusion is drawn from the two statements or in other
both the statements are required to draw the conclusion. Hence, the above conc
is known as mediate inference.

▸ **Term**

In logic, a 'term' is a word or a combination of words, which by itself can be use
subject or predicate of a proposition.

Syllogism is concerned with three terms :

**(a) Major term**—It is the predicate of the conclusion and is denoted by P (first
of Predicate)

**(b) Minor term**—It is the subject of the conclusions and is denoted by S (first let
subject)

**(c) Middle term**—It is the term common to both the premises and is denote
M (first letter of 'Middle').

***e.g.*** **Premises:** (i) All dogs are animals.
(ii) All tigers are dogs.
**Conclusion:** All tigers are animals.

Here, 'animals' is the predicate of the conclusion and so, it is the major term, P. 'Tig
the subject of the conclusion and so, it is the minor term, 'S'. 'Dogs' is the term com
to both the premises and so, it is the middle term, M.

▸ **Major and Minor Premises**

Of the two premises, the major premise is that in which the middle term is the sub
and the minor premises is that in which the middle term is the predicate.

▸ **Methods to Draw Inferences**

**(A) Immediate Inference:** There are various methods to draw immediate inferen
like conversion, obversion, contra-position etc. Depending upon the nature of questi
asked in competitive exams, only two methods of immediate inference are import
implications and conversion.

**(a) Implications (of a given proposition):** While drawing conclusion throu
implication, subject remains the subject and predicate remains the predicate.

**A-type: All boys are blue.**

From the above A-type proposition, it is very clear that if all boys are blue, th
some boys will definitely be blue because some is a part of all. Hence, from A-ty
proposition, we can drawn A-type conclusion (through implication).

**E-type: No cars are buses.**

If no cars are buses, it clearly means that some cars aren't buses. Hence, fr
proposition, O-type conclusion (through implication) can be



**Type: Some chairs are tables.**

rom the above I-type proposition, we cannot draw any valid conclusion (through
nplication).

**)-type: Some A are not B.**

rom the above O-type proposition, we cannot draw any valid inference (through
nplication).

**b) Conversion:** The second important method of immediate inference is conversion.
n it, while drawing inference, subject and predicate of a proposition are interchanged
e. subject becomes the predicate and predicate becomes the subject but the quality
of the proposition remains the same i.e. affirmative and negative remains negative.
n conversion, A-type proposition is converted into I-type, E-type can be converted into
E-type, I-type can be converted into I-type and O-type proposition can't be converted.

**Example:**

(I) **Statement:** All lamps are mangoes (A)
**Conclusion:** Some mangoes are lamps (I)

(II) **Statement:** No men are wise (E)
**Conclusion:** No wise are men (E)

**(B) Mediate Inference:** Like immediate inference, mediate inferences can also be drawn with the help of certain rules and Venn diagrams. There are some rules for mediate inference.

**Step I.** The first step in drawing mediate inferences is the **alignment of statements**. As we know, to draw mediate inference, we need two statements having one term common in both the statements. By alignment it means that predicate of the first statement should be the subject of the second statement, or in other words, we can say that common term is the predicate of the first statement and subject of second statement. Alignment is required only when we find that common term is either subject in both the statements or predicate in both the statements. If the statements are already aligned, then we can move to the step II.

***e.g.*** **Statements:** Some girls are boys.
All girls are black.

***e.g.*** Here, we see that common term 'girls' is subject in both the statements and hence needs alignment. The statements can be aligned in two way :

One by aligning first statement.

Second by aligning second statement and changing the order.

**Case I:** Statement I "Some girls are boys" can be converted into "some boys are girls" using the rule of conversion.

**Case II:** Statement II, "All girls are black" can be converted into "Some black are girls". After converting the second statement and changing the orders of the statements, the statements are aligned as below :

**Statements:** (i) Som e girls.
(ii) All oys.

Since, the statemen bove example can be aligned in two ways, hence it becomes important t which alignment to consider. In this connection, while aligning, priority sho in the following order.

I E A

i.e. importance for conversion should be given first to I-type statement, th and then A-type statement.

**Step II.** After having aligned the statements, if required, inference can be dra the table as given below :

| Types of I statement | | Types of II Statement | | Type of Infere |
|---|---|---|---|---|
| A | + | A | = | A |
| A | + | E | = | E |
| E | + | A | = | O* |
| E | + | I | = | O* |
| I | + | A | = | I |
| I | + | E | = | O* |

The conclusion will follow the pattern in such a way subject of the first state the subject of the inference and predicate of second statement is the predi the inference except the cases O* where conclusion will follow the reverse i.e. subject of the first statement will be predicate of inference and predicate second statement will be the subject of the inference.

The above table shows the combination of statements which produce d inferences.

***e.g.*** **(II) Statements:** (i) Some books are papers.
(ii) No copies are papers.

**Sol.** The statements are not aligned. Hence, first step will be to align the state Statement I is of I type and hence will get the priority for alignment. After alig and recordering, the statement will become :

I. No copies are papers.
II. Some papers are books.

(E-Type can be converted into E-type)

Now, using table for mediate inference, we find that

E + I = O*

Hence, inference will be 'Some books are not copies'.

▸ **Step III. Selecting Complementary Pair of Conclusions**

In drawing mediate inference from given statements, selecting complementary of conclusions is important where neither of the conclusions is definitely true combination of both makes a complementary pair.

***e.g.*** **(I) Statements:** Some cars are scooters.
Some scooters are buses.

**(II) Conclusions:** Some cars are buses.
No cars are buses.

**Sol.** Both the statements are properly aligned hence they fulfill first requirem But both the statements are of I-type and as per table for immediate inferen combination I + I does not produce any valid mediate inference. Hence, no me inference can be drawn.



s important to note that conclusion I 'Some cars are buses' is not valid because there possibility of 'No cars are buses', Likewise, conclusion II 'No cars are buses' is invalid cause there is a possibility of 'Some cars are buses'.

other words, both the conclusions are invalid individually. However, we can say that her conclusion I or II is true. Hence, both the conclusions are invalid individually. owever, we can say that either conclusion I or II is true. Hence, here both the nclusions make a complementary pair of conclusions.

complementary pair of conclusions must follow the following two conditions.

Both of them have the same subject and the same predicate.

They are any one of the three types of pairs,

(a) I-O type
(b) A-O type
(c) I-E type

**ow to Solve Syllogism (Two premises)**

here can be two methods of solving syllogism—the analytical method and the method Venn diagram.

▸ **(A) The Analytical method**

he analytical method for solving syllogism consists of two extremely simple steps:

**tep 1. Aligning the given sentences**

he first step is to properly align the two sentences. A syllogism problem consists of wo propositions and the conclusions. The two given propositions always have one ommon term.

***e.g.*** **(I) Statements:** All **boys** are good looking.
Some **boys** are Indians.

**(II) Statements:** Some girls are **cute**.
Some Americans are **cute**.

ll the examples have two statements where one term is common to both the tatements.

**(III) Statements:** Some lamps are books.
No book is readable.

Here, the statements are properly aligned.

**(IV) Statements:** Some books are crooks.
Some hooks are books.

Here, the statements are not properly aligned.

f the statements are not already aligned, then, they can be aligned by

(a) Changing the order of sentences,
(b) Converting one of the sentences.

. 1. Can be aligned by

**(a)** Converting the first statement.
All boys are good looking $\xrightarrow{\text{Conversion}}$ some good looking are boys.

**(b)** Converting the second statement and changing the order ⟶ Some Indian are boys.

All boys are good looking.

▸ **For conversion, remember the rule of IEA**

That is, given a pair of to-be-aligned sentences, the priority should be g converting to I-type statement, to E-type and then to A-type statement in t Hence, if in the given pair one sentence is of type I and the other of type A sentence of type I should be converted.

▸ **Step II. Use Table to Draw Conclusions**

The table gives correct results if and only if the two sentences have been aligned.

***e.g.*** **(I) Statement:** Some pencils are torches.
No books are pencils.

**Sol.** The common term 'Pencils' is a subject in one sentence and a predicate in Hence, changing the order of the statements is sufficient to align the two se The aligned pair will be :

No books are pencils.
Some pencils are torches.

E+ I = O* i.e. conclusion is of type O but the subject of the conclusion is the p of the second sentence and the predicate of the conclusion is the subject of t sentence. Hence, conclusion is

Some torches are not books.

***e.g.*** **(II) Statements:** No bandit is kindhearted.
All bandits are blackmailers.

**Sol.** By the rule of IEA we convert the E-type statement. The aligned pair is

No kindhearted is a bandit.
All bandits are blackmailers.

E + A = O. Hence, conclusion is

Some blackmailers are not kindhearted.

**Step III. Check for Any Immediate Inferences (implication or conversion)**

***e.g.*** **Statements:** All books are chairs.
All chairs are red.
**Conclusions:** All books are red.
Some red are books.

**Sol.** Here, we have already aligned sentences. A + A = A. Hence, the conclusion be 'All books are red.' But if we convert this conclusion, we obtain.

Some red are books.

Hence, both the conclusions given above are true.

**Step IV. Check for Complementary Pair**

In a complimentary pair, at least one of the two statements is always true. Two statements make a complimentary pair if :

(a) Both of them have the same subject and the same predicate.
(b) They are an I-O pair or an A-O type pair or and I-E type pair.

For a complimentary pair, choose either of them follows.



**mmary of Analytical Method:**

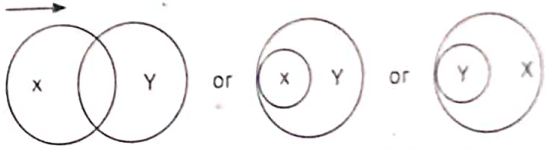
**Step I.** Properly align the sentences.
**Step II.** Use table to draw conclusions.
**Step III.** Check for immediate inference.
**Step IV.** Check for complimentary pairs, if step II and III fail.

**) The Method of Venn Diagrams**

e steps followed are

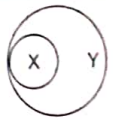
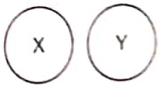
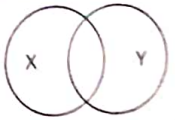
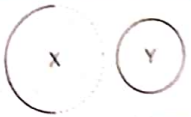
**ep I**

aw standard representation for both the statements separately as given under. ome X are Y" →




r practical purpose, first of these representations is followed.

**ble of standard representation**

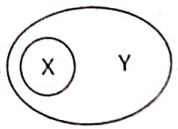
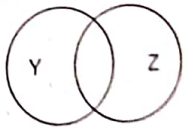
| Statement of Type | Standard representation |
|---|---|
| A (All X are Y) |  |
| E (No X is Y) |  |
| I (Some X are Y) |  |
| O (Some X are not Y) |  |

**p II**

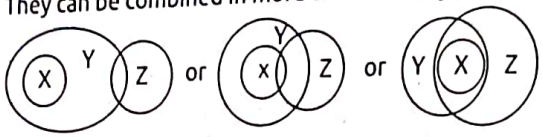
low, try to combine the representations in as many ways as possible. (As many ways neans one should combine the representations in all possible ways).

or *e.g.*, If statement I is "All X are Y".
statement II is "Some Y are Z".

hen standard representation are :

1.  and 2. 

They can be combined in more than one ways and the possible ways are




So, draw all possible combinations.

▸ **Step III**

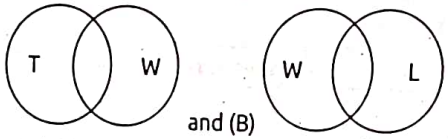
Finally, make interpretations from the combined figures (Obtained from st given conclusion will be true if and only if it is supported by all the combine and no combined figure contradicts it.

**Ex. 1. Statements:** A. Some tables are watches.
B. Some watches are lamps.

**Conclusions:** I. Some tables are lamps.
II. Some tables are not lamps.

**Sol.**

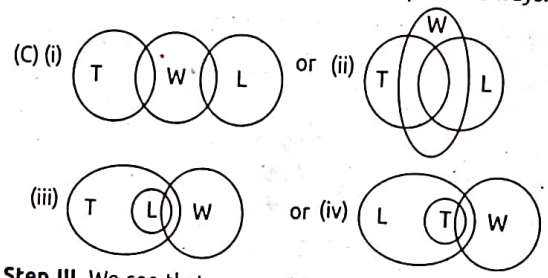
**Step I.**




(A) and (B)

Let T = tables, W = Watches, L = Lamps.

**Step II.** Combining both the figures in all possible ways.




**Step III.** We see that same tables are lamps is supported by C (ii), (iii) and (iv) some tables are not lamps is supported by C(i). Thus, at least one of these cond is always following. Hence, either of the two follows.

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-16):** In each question below are given two statements fol by two conclusions numbered I and II. Read the conclusion and then decide wh the given conclusions logically follows from the two given statement.

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.



1. **Statements:** All film stars are playback singers.
All film directors are film stars.
**Conclusions:** I. All film directors are playback singers.
II. Some film stars are film directors.

2. **Statements:** All pens are roads.
All roads are houses.
**Conclusions:** I. All houses are pens.
II. Some houses are pens.

3. **Statements:** All bags are cakes.
All lamps are cakes.
**Conclusions:** I. Some lamps are bags.
II. No lamp is bag.

4. **Statements:** All tubes are handles.
All cups are handles.
**Conclusions:** I. All cups are tubes.
II. Some handles are not cups.

Q 5. **Statements:** All roads are waters.
Some waters are boats.
**Conclusions:** I. Some boats are roads.
II. All waters are boats.

Q 6. **Statements:** All men are married.
Some men are educated.
**Conclusions:** I. Some married are educated.
II. Some educated are married.

Q 7. **Statements:** Some dedicated souls are angels.
All social workers are angels.
**Conclusions:** I. Some dedicated souls are social workers.
II. Some social workers are dedicated souls.

Q 8. **Statements:** Some dreams are nights.
Some nights are days.
**Conclusions:** I. All days are either nights or dreams.
II. Some days are nights.

Q 9. **Statements:** Some books are tables.
Some tables are mirrors.
**Conclusions:** I. Some mirrors are books.
II. No book is mirror.

Q 10. **Statements:** Some desks are caps.
No cap is red.
**Conclusions:** I. Some caps are desks.
II. No desk is red.

Q 11. Statements: Some books are pens.
No pen is pencil.
Conclusions: I. Some books are pencils.
II. No book is pencil.

Q 12. Statements: No magazine is cap.
All caps are cameras.
Conclusions: I. No camera is magazine.
II. Some cameras are magazines.

Q 13. Statements: No women teacher can play.
Some women teachers are athletes.
Conclusions: I. Male athletes can play.
II. Some athletes can play.

Q 14. Statements: All poles are guns.
Some boats are not poles.
Conclusions: I. All guns are boats.
II. Some boats are not guns.

Q 15. Statements: No man is a donkey.
Rahul is a man.
Conclusions: I. Rahul is not a donkey.
II. All men are not Rahul.

Q 16. Statements: All boys are honest.
Sachin is honest.
Conclusions: I. Sachin is a boy.
II. All honest persons are boys.

**Directions (Q. Nos. 17-25) :** In each of the following questions two statement given followed by three or four conclusions numbered I, II, III and IV. Decide w of the given conclusions logically follows from the given statements disregar commonly known facts.

Q 17. Statements: All branches are flowers.
All flowers are leaves.
Conclusions: I. All branches are leaves.
II. All leaves are branches.
III. All flowers are branches.
IV. Some leaves are branches.

a. None follows
b. Only I and IV follow
c. Only II and III follow
d. All follow



18. Statements: All politicians are honest.
All honest are fair.
Conclusions: I. Some honest are politicians.
II. No honest is politician.
III. Some fair are politicians.
IV. All fair are politicians.

a. None follows
b. Only I follows
c. Only I and II follow
d. Only I and III follow

19. Statements: All terrorists are guilty.
All terrorists are criminals.
Conclusions: I. Either all criminals are guilty or all guilty are criminals.
II. Some guilty persons are criminals.
III. Generally criminals are guilty.
IV. Crime and guilt go together.

a. Only I follows
b. Only I and III follow
c. Only II follows
d. Only II and IV follow

20. Statements: Some bags are pockets.
No pocket is a pouch.
Conclusions: I. No bag is a pouch.
II. Some bags are not pouches.
III. Some pockets are bags.
IV. No pocket is a bag.

a. None follows
b. Only I and III follow
c. Only II and III follow
d. Only either I or IV follows

Q 21. Statements: Some taxis have horns.
Some taxis I have lights.
Conclusions: I. Every taxi has either horn or light.
II. Some taxis have neither light nor horn.
III. Some taxis have horns as well as lights.
IV. No taxi has horn as well as light.

a. Only I and II follow
b. Only II and III follow
c. Only II and IV follow
d. Either III or IV follows

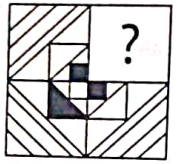
## ANSWERS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (e) | 2. | (b) | 3. | (c) | 4. | (d) | 5. | (d) | 6. | (e) | 7. | (d) | 8. | (b) |
| 9. | (c) | 10. | (a) | 11. | (c) | 12. | (c) | 13. | (d) | 14. | (d) | 15. | (a) | 16. | (d) |
| 17. | (b) | 18. | (d) | 19. | (c) | 20. | (c) | 21. | (d) | | | | | | |

## 2. Pattern Completion

▶ In this type of questions, a segment in a figure generally a quarter is left bla incomplete figure is followed by choices showing the missing segment which in the incomplete figure completes the figure. Candidates are required to sel option carefully as all the given alternatives have minute difference between th

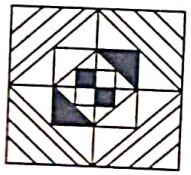
**Ex 1.** In the following question, Complete the missing segment of the given p by selecting from the given alternatives (a), (b), (c) and (d).




(X)

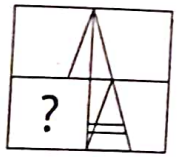
(a) (b) (c) (d)

**Sol.** (a)



If figure, as shown in the alternative (a), is placed in the missing portion o original figure, it gets completed and looks like as shown in the adjacent fi Hence, option (a) is the correct choice.

**Ex 2.** Select a figure from the four alternatives, which when placed in the mis portion of the original figure as shown by figure (X) would complete pattern.

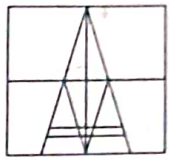



(X)

(a) (b) (c) (d)



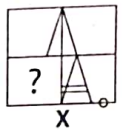
**Sol.** (c) It is clear that alternative (c) completes the figure (X), when it is fitted in it. Figure (X) appears same as shown adjacent figure when it gets completed. Hence, alternative (c) is the correct answer.



## Multiple Choice Questions ▼

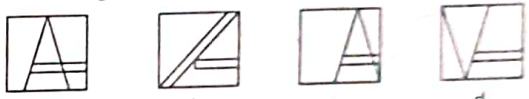
**Directions (Q. Nos. : 1-26) :** In each of the following questions, select a figure from amongst the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.

**Q 1.** Question Figure



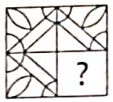

X

Answer Figures



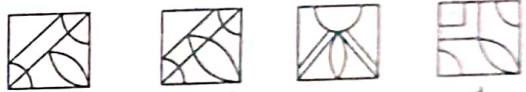
a. b. c. d.

**Q 2.** Question Figure



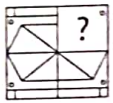

X

Answer Figures



a. b. c. d.

**Q 3.** Question Figure




X

Answer Figures

a. b. c. d.

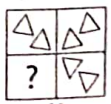
**Q 4.** Question Figure


X

Answer Figures

a. b. c. d.

**Q 5.** Question Figure

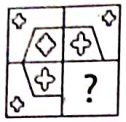



X

Answer Figures

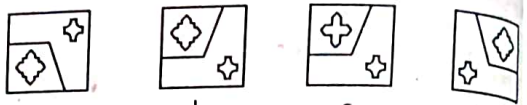
a. b. c. d.

Question Figure

Q 6. 

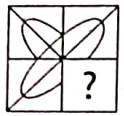
X

Answer Figures



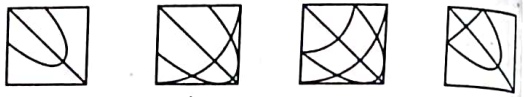
a. b. c. d.

Question Figure

Q 7. 

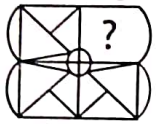
X

Answer Figures



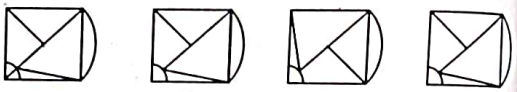
a. b. c. d.

Question Figure

Q 8. 

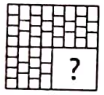
X

Answer Figures



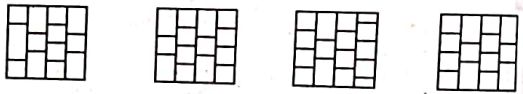
a. b. c. d.

Question Figure

Q 9. 

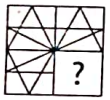
X

Answer Figures



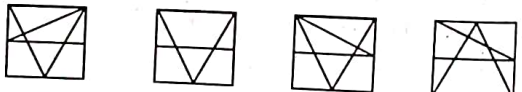
a. b. c. d.

Question Figure

Q 10. 

X

Answer Figures



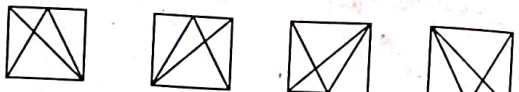
a. b. c. d.

Question Figure

Q 11. 

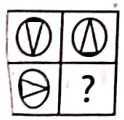
X

Answer Figures



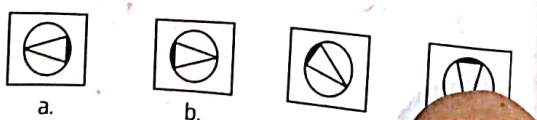
a. b. c. d.

Question Figure

Q 12. 

X

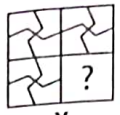
Answer Figures



a. b. c.

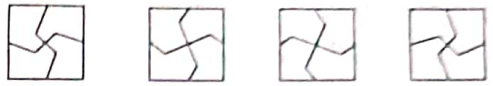


Question Figure

Q 13. 

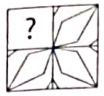
X

Answer Figures



a. b. c. d.

Question Figure

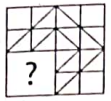
Q 14. 

X

Answer Figures

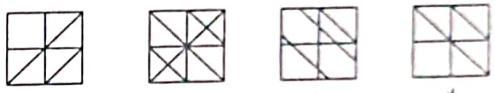
a. b. c. d.

Question Figure

Q 15. 

X

Answer Figures



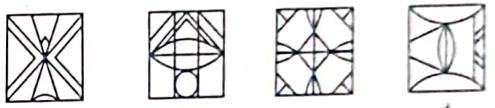
a. b. c. d.

Question Figure

Q 16. 

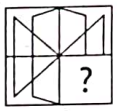
X

Answer Figures



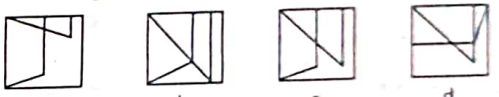
a. b. c. d.

Question Figure

Q 17. 

X

Answer Figures



a. b. c. d.

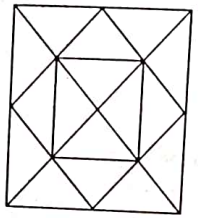
## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (c) | **2.** | (a) | **3.** | (b) | **4.** | (b) | **5.** | (d) | **6.** | (b) | **7.** | (d) | **8.** | (d) |
| **9.** | (d) | **10.** | (c) | **11.** | (c) | **12.** | (a) | **13.** | (d) | **14.** | (a) | **15.** | (d) | **16.** | (c) |
| **17.** | (c). | | | | | | | | | | | | | | |

## 3. Counting of Figures Test

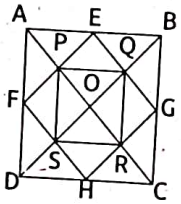
▶ Questions on this chapter of non-verbal reasoning involve counting of geome figures in a given figure, which is a mixture of two or more types of complex fig These questions form an integral part of non-verbal reasoning and are designe test the analytical approach of the students. Few examples have been given bel illustrate the type of these questions.

**Ex. 1** How many squares are there in the figure given below?



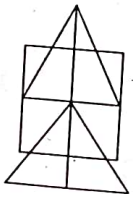
(a) 4
(b) 5
(c) 6
(d) 7

**Sol.** (d) The figure in question has been marked as shown in the figure.



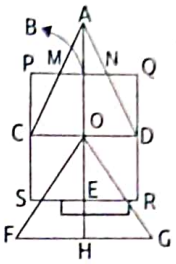

It is clear from the figure that there are seven squares in the figures as: FPOS, EPOQ, QORG , ORHS, ABCD, PQRS and EGHF.
Hence, the correct answer is (d).

**Ex. 2** Count the number of triangles in the figure given below:



(a) 17
(b) 13
(c) 14
(d) 16

**Sol.** (d) After labelling the figure in the question, it looks like as under:
There are sixteen triangles in this figure namely:

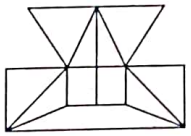



AMN, AMB, ABN, ACD, ACO, AOD, OSR, OSE, OER, OSG, OFH, OHG, PMC, NQD, COS and ODR. Since there are sixteen triangles and this number is not mentioned in the alternatives, hence our answer is (d).

## Multiple Choice Questions ▼

**Directions (Q.Nos. 1-2):** In each of the following questions, find the minimum number of straight lines required to make the given figure.

**Q 1.** a. 16
b. 17
c. 18
d. 19

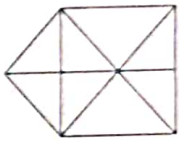


**Q 2.** a. 9
b. 11
c. 15
d. 16

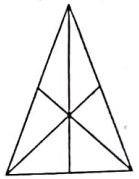
**Directions (Q.Nos.3-12):** In each of the following questions, find the number of triangles in the given figure.

**Q 3.** a. 5
b. 6
c. 8
d. 10

**Q 4.** a. 15
b. 16
c. 17
d. 18

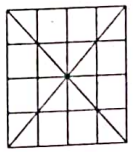


**Q 5.** a. 16
b. 13
c. 9
d. 7



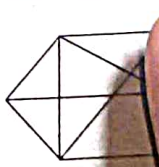
**Q 6.** a. 8
b. 10
c. 12
d. 14

**Q 7.** a. 36
b. 40
c. 44
d. 48

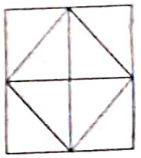


**Q 8.** a. 5
b. 12
c. 9
d. 10

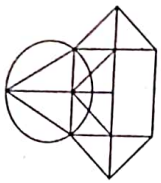
**Q 9.** a. 12
b. 13
c. 14



**Q 10.** a. 18
b. 13
c. 28
d. 34



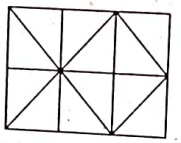
**Q 11.** a. 10
b. 12
c. 14
d. 16



**Q 12.** a. 28
b. 32
c. 36
d. 40

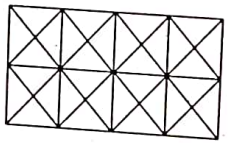
**Directions (Q.Nos. 13-18):** In each of the following questions, count the numbe squares in the given figure.

**Q 13.** a. 6
b. 7
c. 9
d. 10



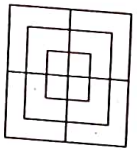
**Q 14.** a. 32
b. 30
c. 29
d. 28

**Q 15.** a. 11
b. 21
c. 24
d. 26



**Q 16.** a. 22
b. 20
c. 18
d. 14

**Q 17.** a. 8
b. 12
c. 15
d. 18



**Q 18.** a. 12
b. 13
c. 16
d. 17

## ANSWERS

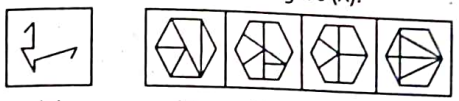
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (b) | **3.** | (d) | **4.** | (c) | **5.** | (a) | **6.** | (c) | **7.** | (d) | **8.** | (d) |
| **9.** | (d) | **10.** | (c) | **11.** | (c) | **12.** | (c) | **13.** | (c) | **14.** | (b) | **15.** | (c) | **16.** | (c) |
| **17.** | (c) | **18.** | (d). | | | | | | | | | | | | |



# 4. Spotting Out the Embedded Figures

▶ In this chapter, a figure is given as an original figure followed by four answer figures. One of these answer figures is embedded or hidden in the original figure. Candidates are required to select the alternative that carries the correct figure and which shows the embedded portion in the original figures.

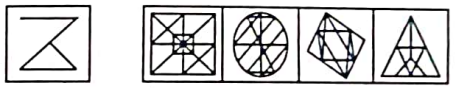
**Ex. 1** Figures (X) is embedded in any one of the four alternative figures. Select the alternative which contains figure (X).



(X) (a) (b) (c) (d)

**Sol.** (d) It is clear from the alternative figures that figure (X) is embedded in figure (d). The portion which the question figure occupies in alternative figure (d) has been shown in the adjacent diagram. Hence, our answer is (d).

**Ex. 2** Figure (X) is embedded in any one of the four alternative figures. Choose the alternative which contains figure (X).



(X) (a) (b) (c) (d)

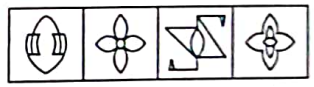
**Sol.** (b) Clearly figure (X) is embedded in alternative figure (b). The portion which figure (X) occupies in the alternative figure has shown in the adjacent diagram. Hence, our answer is (b).

## Multiple Choice Questions ▼

**Q 1.** Question Figure

X

Answer Figures



a. b. c. d.

**Q 2.** Question Figure

X

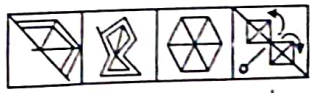
Answer Figures

a. b. c. d.

**Q 3.** Question Figure

X

Answer Figures



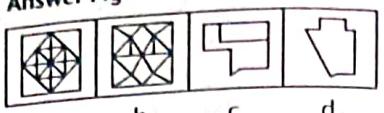
a. b. c. d.

Question Figure

Q 4. 

X

Answer Figures



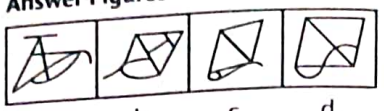
a. b. c. d.

Question Figure

Q 5. 

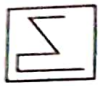
X

Answer Figures



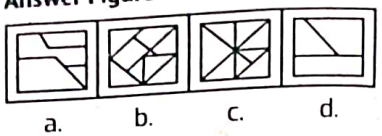
a. b. c. d.

Question Figure

Q 6. 

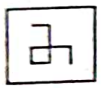
X

Answer Figures



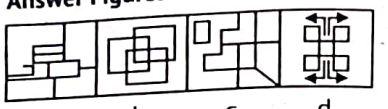
a. b. c. d.

Question Figure

Q 7. 

X

Answer Figures



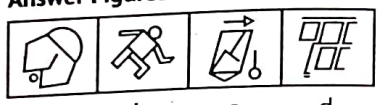
a. b. c. d.

Question Figure

Q 8. 

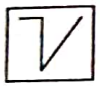
X

Answer Figures



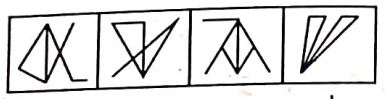
a. b. c. d.

Question Figure

Q 9. 

X

Answer Figures



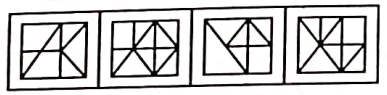
a. b. c. d.

Question Figure

Q 10. 

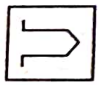
X

Answer Figures



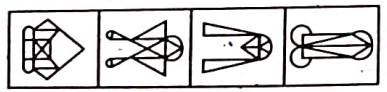
a. b. c. d.

Question Figure

Q 11. 

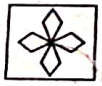
X

Answer Figures



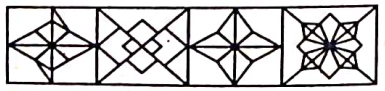
a. b. c. d.

Question Figure

Q 12. 

X

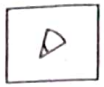
Answer Figures



a. b. c. d.



Question Figure

Q 13. 

X

Answer Figures

a. b. c. d.

Question Figure

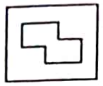
Q 14. 

X

Answer Figures

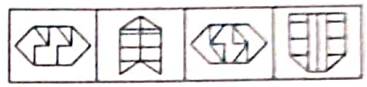
a. b. c. d.

Question Figure

Q 15. 

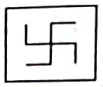
X

Answer Figures



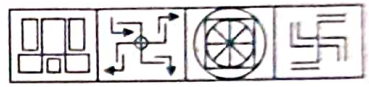
a. b. c. d.

Question Figure

Q 16. 

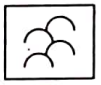
X

Answer Figures



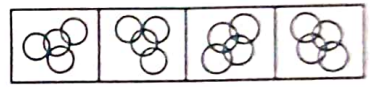
a. b. c. d.

Question Figure

Q 17. 

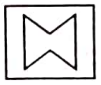
X

Answer Figures



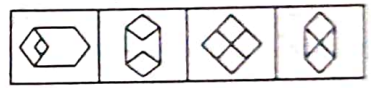
a. b. c. d.

Question Figure

Q 18. 

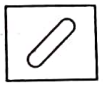
X

Answer Figures



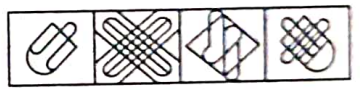
a. b. c. d.

Question Figure

Q 19. 

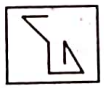
X

Answer Figures



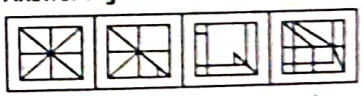
a. b. c. d.

Question Figure

Q 20. 

X

Answer Figures



a. b. c. d.

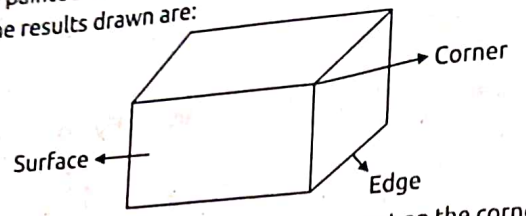
## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (c) | **2.** | (a) | **3.** | (d) | **4.** | (d) | **5.** | (d) | **6.** | (d) | **7.** | (b) | **8.** | (b) |
| **9.** | (b) | **10.** | (b) | **11.** | (b) | **12.** | (d) | **13.** | (b) | **14.** | (a) | **15.** | (c) | **16.** | (c) |
| **17.** | (c) | **18.** | (b) | **19.** | (b) | **20.** | (d) | | | | | | | | |

# 5. Cube and Dice

## Cube

It is a three dimensional figure having 8 corners, 6 surfaces and 12 edges as shown here. If a cube is painted on all of its surfaces with any colour and further divided into smaller cubes, the results drawn are:




1. Smaller cubes with three surfaces painted are present on the corners of the bigger cube.
2. Smaller cubes with two surfaces painted are present on the edges of the bigger cube.
3. Smaller cubes with one surface painted are present on the surfaces of the big cube.
4. Smaller cubes with no surface painted will be present inside the big cube (*i.e.*, the body).

Now, if a cube is painted on all of its surfaces and then divided into smaller cubes of equal size, the cubes of so obtained are:

(a) cubes with 3 surfaces painted = 8 (at the corners)

(b) cubes with 2 surfaces painted = $(n-2) \times 12$ (at the edges)

(c) cubes with one surface painted = $(n-2)^2 \times 6$ (at the surfaces or faces)

(d) cubes with no surface painted = $(n-2)^3$ (at the body or middle)

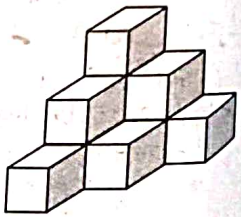
$$\text{where, } n = \frac{\text{length of edge of big cube}}{\text{length of edge of one smaller cube}}$$

The questions related to cubes can be of the following types:

▶ **Type 1: Counting the Number of Cubes in the Given Figure**

When the number of cubes in a figure are to be counted, the procedure is as shown from the following example:

**Ex. 1** Count the number of blocks in the given figure:



(a) 14 (b) 12

(c) 10 (d) 18

**Sol.** (c) From the figure it is clear that there are (i) column containing 3 cubes, (ii) columns containing 2 cubes each and (iii) columns containing 1 cube each.

So, (a) Number of cubes in columns of 3 cubes = $1 \times 3 = 3$

(b) Number of cubes in columns of 2 cubes = $2 \times 2 = 4$



(c) Number of cubes in columns of 1 cube = $3 \times 1 = 3$

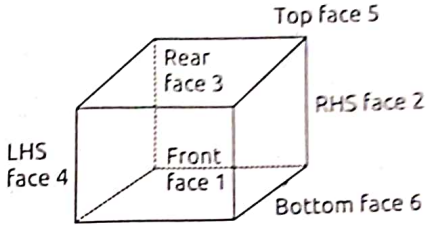
Therefore, the total number of cubes = $3 + 4 + 3 = 10$

Hence, (c) is the correct answer.

▶ **Type 2: Colouring the Six Faces of a Cube**

In this type, certain specifications are provided for colouring the six faces of a cube and candidate has to analyse the colour structure of the cube.

The six faces of a cube are labelled as




Front face → Face no. 1
RHS face → Face no. 2
Rear face → Face no. 3
LHS face → Face no. 4
Top face → Face no. 5
Bottom face → Face no. 6

Such colouring of six faces of a cube can be of the following types:

▶ **Type 2.1: Colouring of Faces With Single Colour**

If a cube is painted on all its surfaces with a single colour and then divided into various smaller cube of equal size, various cubes are obtained.

**Ex. 2** If a cube of side 4 cm is painted black on all its surfaces and then divided into various smaller cubes of side 1 cm each. The smaller cubes so obtained are $\frac{4\times4\times4}{1\times1\times1} = 64$.

$$\text{Here, } n = \frac{\text{side of big cube}}{\text{side of small cube}} = \frac{4}{1} = 4$$

Find the number of smaller cubes with 3 surfaces painted:

(a) 8 (b) 24 (c) 26 (d) 30.

**Sol.** (a) Number of smaller cubes with 3 surfaces painted = 8.

▶ **Type 2.2: Colouring of Faces With Different Colours**

If a cube is painted on all its surfaces with different colours and then divided into various smaller: cubes of equal size, the various different coloured cubes are obtained.

**Ex. 3** A cube of side 4 cm is painted black on the pair of one opposite surfaces blue on the pair of another and red on the remaining pair. The cube is now divided into smaller cubes of 1 cm each.

Find the number of smaller cubes with no surfaces painted.

(a) 4 (b) 8 (c) 16 (d) 24.

Q 6. How many cubes have three faces coloured?
a. 24 b. 16 c. 8 d. 4.

Directions (Q. Nos. 7-11): Study the given information carefully, answer the following questions:

A cube is coloured red on one face, green on the opposite faces, yellow on another face and blue on a face adjacent to the yellow face. The other two faces are left uncoloured. It is then cut into 125 smaller cubes of equal size.

Q 7. How many cubes are uncoloured on all the faces?
a. 64 b. 48 c. 36 d.27.

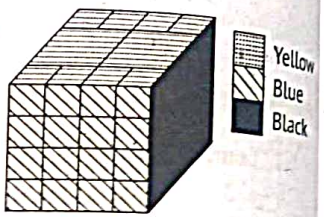
Q 8. How many cubes have at least two coloured faces?
a. 24 b. 21 c. 19 d.16.

Q 9. How many cubes are coloured red on one face and have the remaining faces uncoloured?
a. 16 b. 12 c. 20 d. 8.

Q 10. How many cubes have at least one green face?
a. 5 b. 16 c. 25 d.32.

Q 11. How many cubes are coloured blue on one face, red or green on another face and have four uncoloured faces?
a. 4 b. 8 c. 12 d.16.

Directions (Q. Nos. 12-16): Study the given information carefully, answer the following questions:




A solid cube has been painted yellow, blue and black on pairs of opposite face. The cube is then cut into 36 smaller cubes such that 32 cubes are of the same size while others are of bigger size. Also no face of any of the bigger cubes is painted blue.

Q 12. How many cubes have at least one face painted blue?
a. 0 b. 8 c. 16 d. 32.

Q 13. How many cubes have only one face painted?
a. 0 b. 4 c. 8 d.12.

Q 14. How many cubes have only two faces painted?
a. 24 b. 20 c. 16 d. 8.

Q 15. How many cubes have two or more face painted?
a. 36 b. 34 c. 28 d.24.

Q 16. How many cubes have only three faces painted?
a. 8 b. 4 c. 2 d. 0.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (c) | 2. | (c) | 3. | (c) | 4. | (d) | 5. | (a) | 6. | (c) | 7. | (b) | 8. | (b) |
| 9. | (a) | 10. | (c) | 11. | (b) | 12. | (d) | 13. | (c) | 14. | (b) | 15. | (c) | 16. | (a) |



# 6. Paper Cutting and Folding

Paper folding and cutting problems are based on a transparent sheet which is folded along a dotted line or folded and cut (or punched) in a particular manner.

Problems based on 'Paper Folding' involves folding a transparent sheet along a dotted line. So, that the design on one side of the dotted line gets superimposed on the design on the other side.

In such type of questions, a transparent sheet having a certain design and a dotted line on it is given. The candidates are required to identify the design (or pattern) that would be formed when the sheet is folded along the dotted line.

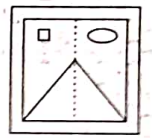
In the questions based on paper cutting, few figures are given showing the way in which a piece of paper is to be folded and then cut from a particular section. The dotted line is the reference line along which the paper is to be folded and the arrow indicates the direction of the fold.

The candidates are required to identify the design or pattern that would be formed when the sheet is unfolded.

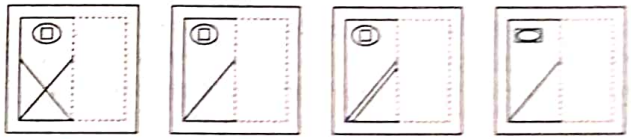
Examples given here, will give you a better idea about the types of questions asked in various competitive exams.

**Ex. 1** Select the option that depicts how the given transparent sheet of paper would appear if it is folded at the dotted line.

**Problem Figure**



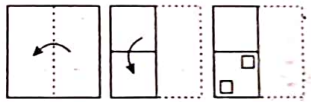
**Answer Figures**



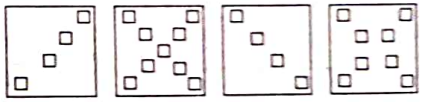

**Sol.** (b) By observing all 4 figures, when the given sheet of paper is folded at the dotted line, it appear/look as figure (b).

**Ex. 2** In the following question, a set of three figures (X), (Y) and (Z) have been given, showing a sequence in which paper is folded and finally cut from a particular section. These figures are followed by a set of answer figures marked (a), (b), (c) and (d) showing the design which the paper actually acquires when it is unfolded. You need to select the answer figure which is closest to the unfolded piece of paper.

**Problem Figure**




**Answer Figures**

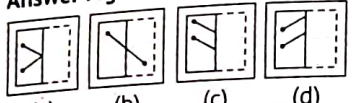


**Sol.** (d) In figure (X), the 'square' of symmetry, so that right half of the sheet overlaps the left half. In figure (Y), the sheet is folded further to a quarter. In figure (Z), two squares are punched in the folded sheet. Clearly, the punched squares will be created in each quarter of the paper and after unfolding the first fold the figure will look like as, then after unfolding the last fold the transparent sheet will look like as given in option (d) i.e.,

## Multiple Choice Questions ▼

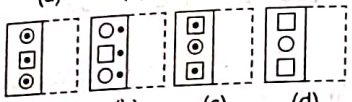
**Directions (Q. Nos. 1-12):** in each of the following questions, a figure marked as transparent sheet is given and followed by four answer figures, one out of these four options resembles the figure which is obtained by folding the transparent sheet along the dotted line. Find the answer from these figures.

**Q 1.** **Transparent Sheet** **Answer Figures**



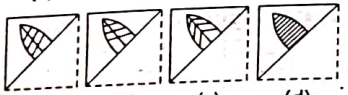
(a) (b) (c) (d)

**Q 2.**



(a) (b) (c) (d)

**Q 3.**

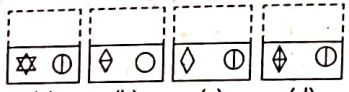


(a) (b) (c) (d)

**Q 4.**

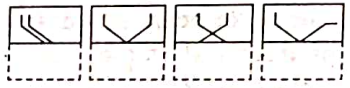
(a) (b) (c) (d)

**Q 5.**



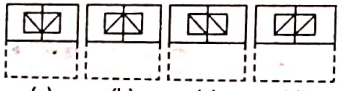
(a) (b) (c) (d)

**Q 6.**



(a) (b) (c) (d)

**Q 7.**



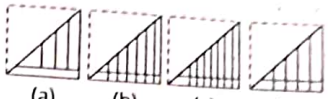
(a) (b) (c) (d)

**Q 8.**

(a) (b) (c) (d)



**Q 9.**

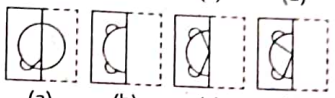


(a) (b) (c) (d)

**Q 10.**

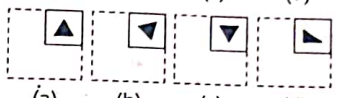
(a) (b) (c) (d)

**Q 11.**



(a) (b) (c) (d)

**Q 12.**



(a) (b) (c) (d)

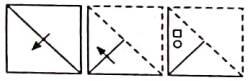
**Q 13. Select the option that depicts how the given transparent sheet of paper would appear if it is folded at the dotted line.**

**Problem Figures** **Answer Figures**

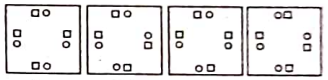
(a) (b) (c) (d)

**Directions (Q. Nos. 14-23):** A piece of paper is folded and a cut is made as shown below. From the given responses indicate how it will appear when opened?

**Q 14.** **Problem Figures**

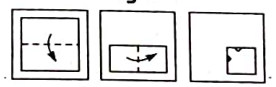


**Answer Figures**

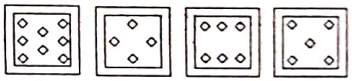


(a) (b) (c) (d)

**Q 15.** **Problem Figures**



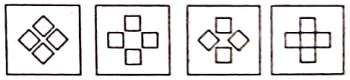
**Answer Figures**



(a) (b) (c) (d)

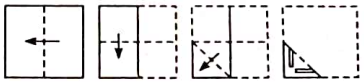
**Q 16.** **Problem Figures**

**Answer Figures**

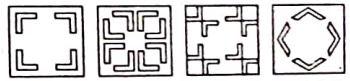


(a) (b) (c) (d)

**Q 17.** **Problem Figures**

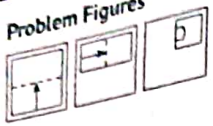


**Answer Figures**

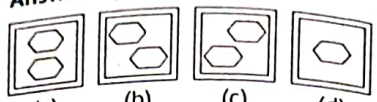


(a) (b) (c) (d)

Q 18. Problem Figures

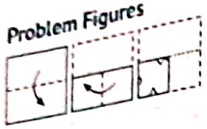


Answer Figures

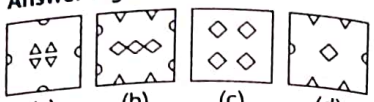


(a) (b) (c) (d)

Q 19. Problem Figures

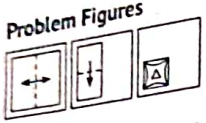


Answer Figures

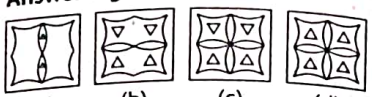


(a) (b) (c) (d)

Q 20. Problem Figures

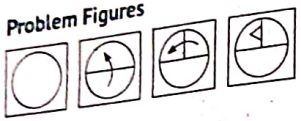


Answer Figures

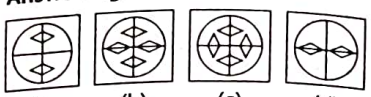


(a) (b) (c) (d)

Q 21. Problem Figures

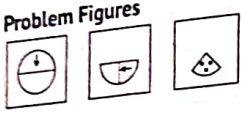


Answer Figures

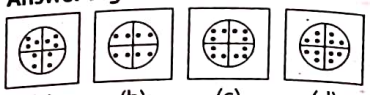


(a) (b) (c) (d)

Q 22. Problem Figures

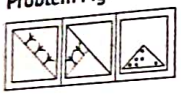


Answer Figures

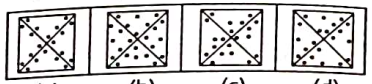


(a) (b) (c) (d)

Q 23. Problem Figures



Answer Figures



(a) (b) (c) (d)

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (a) | 2. | (c) | 3. | (d) | 4. | (d) | 5. | (a) | 6. | (b) | 7. | (a) | 8. | (c) |
| 9. | (a) | 10. | (b) | 11. | (d) | 12. | (c) | 13. | (c) | 14. | (b) | 15. | (b) | 16. | (b) |
| 17. | (b) | 18. | (a) | 19. | (b) | 20. | (c) | 21. | (a) | 22. | (c) | 23. | (c). | | |



# 7. Data Sufficiency

Data sufficiency is a method to analyse the given set of information and decide whether the given information is sufficient to answer the question. Data sufficiency questions include problems based on Coding-Decoding, Blood-Relations, Direction Sense Test, Ranking and Time Sequence Test, Arithmetical Reasoning, Mathematical Operations and Puzzle Test etc.

The problems based on this topic consist of two or more than two statements containing the information related to it. You have to decide whether the problem can be solved by using the information from the given statements combined or individually.

In these questions, it is also possible that either of the given statements is sufficient to answer the question.

**Directions (Ex. 1-4)** The questions given below consist of a question followed by two statements numbered as I and II. We have to decide whether these statements give enough information required to answer the question or not.

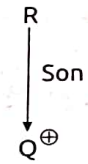
**Give answers**

(a) If Statement I alone is sufficient to answer the question
(b) If Statement II alone is sufficient to answer the question
(c) If Statements I and II together are sufficient to answer the question
(d) If Statement I or II alone is sufficient to answer the question
(e) If Statements I and II together are not sufficient to answer the question

**Ex. 1** How is P related to R?

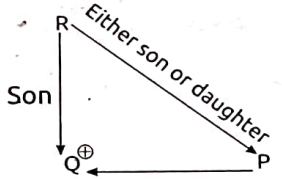
I. Q is the son of R.
II. Q is the brother of P.

**Sol.** (e) **Statement I**




**Statement II**


Now, from both statements,




Here, P is either the son or daughter of R. So, we cannot find the exact relation between P and R. Hence, Statements I and II together are not sufficient to answer the question.

**Ex. 2** Who is older Ritu or Situ?

I. Situ was born in the year 1980 and is 5 yr younger than Ritu's brother.

II. Ritu is twice as old as her brother.

**Sol.** (c) From Statement I, it is clear that Situ is younger than Ritu's brother.

From Statement II, it is clear that Ritu is older than her brother.

So, from both the statements, we get

Ritu > Ritu's brother > Situ

Hence, Ritu is older than Situ.

**Direction (Ex. 3)** In the question given below, three statements I, II and III are given. You are required to find out which of the given statements is/are sufficient to answer the question.

**Ex. 5** On which day Suresh went to Chennai, if week starts on Monday?

I. Suresh took leave on Wednesday.

II. Suresh went to Chennai the next day of the day his mother came to his house.

III. Suresh's mother came to his house neither on Monday nor Friday.

(a) II and III (b) I and II

(c) I and III (d) All are needed

(e) Even I, II and III together are not sufficient

**Sol.** (e) Statements I, II and III together are not sufficient as the required day can be anyone of Wednesday, Thursday, Friday and Sunday.

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-7)** Each of the following question below consists of a question and two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the questions.

**Give answer**

(a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question

(b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question

(c) If the data either in Statement I alone or in Statement II alone is sufficient to answer the question

(d) If the data in both Statements I and II together are necessary to answer the question

(e) If the data in both the Statements I and II together are not sufficient to answer the question

**1. Who amongst L, M, N, O and P is the shortest?**

I. O is shorter than P, but taller than N.

II. M is not as tall as L.



**2. Point A is towards which direction from Point B?**

I. If a person walks 4 m towards the North from Point A and takes two consecutive right turns, each after walking 4 m, he would reach Point C, which is 8 m away from Point B.

II. Point D is 2 m towards the East of point A and 4 m towards the West of point B.

**3. How many brothers does Bharat have?**

I. Shiela, the mother of Bharat has only three children.

II. Meena, the grandmother of Bharat has only one granddaughter.

**4. Is T the grandmother of Q?**

I. P is the mother of Q. Q is the son of R. R is son of T.

II. L is the father of N and N is the daughter of T.

**5. Are all the five friends viz. Leena, Amit, Arun, Ali and Ken who are seated around a circular table facing the centre?**

I. Leena sits second to the left of Amit. Amit faces the centre. Arun sits second to the right of Leena.

II. Ali sits third to the left of Ken. Ken faces the centre. Amit sits to the immediate left of Ali but Ken is not an immediate neighbour of Amit.

**6. On which day of the month is definitely Meena's birthday? If**

I. Meena's brother correctly remembers that Meena's birthday is after 25th but before 29th of this month.

II. Meena's father correctly remembers that Meena's birthday is after 27th but before 31st of this month.

**7. What is the value of 144$16*7#9? If**

I. '$' means '÷', '*' means 'x' and '#' means '+'.

II. 16 $4 * 2 #2=10

**Directions (Q. Nos. 8-14)** Each question consists of a question and two statements numbered I and II given below it. You have to decide, whether the data provided in the statements are sufficient to answer the question. Read both the statements and mark the appropriate answer.

**Give answer**

(a) If the data even in both statements together are not sufficient to answer the question

(b) If the data in Statement I alone is sufficient to answer the question while the data in Statement II alone is not sufficient to answer the question

(c) If the data either in Statement I alone or in Statement II alone is sufficient to answer the question

(d) If the data in both statements I and II together are necessary to answer the question

(e) If the data in Statement II alone is sufficient to answer the question while the data in Statement I is not sufficient to answer the question

8. **How many sisters does Madhu have?**
   I. Madhu's parents have four children.
   II. Madhu has three brothers.
9. **Is R the granddaughter of C?**
   I. The only sister of A is the mother of R's brother, B.
   II. C, the mother of A has only one grandson, B.
10. **Four friends A, B, C and D are seated in circle facing the centre but not necessarily in the same order. Is anyone seated exactly between C and D, when counted from the left of C?**
   I. B is seated to the immediate right of C.
   II. B is seated to the immediate left of A. D is not an immediate neighbour of B.
11. **Among five friends M, N, O, P and Q (each earning a different amount), who earns the least?**
   I. M earns more than O, P and N.
   II. P earns more than only O.
12. **Among A, B, C, D and E, seated in a straight line, but not necessarily in the same order, facing North, who sits exactly in the middle of the line?**
   I. A sits third to left of D. B sits to the immediate right of C.
   II. B sits second to right of A. E is not an immediate neighbour of D.
13. **How many people are standing in a straight line?**
   **Note All are facing North.**
   I. U stands third from the left end of the line. U is an immediate neighbour of P and W. Only one person stands between W and T. Only two people stand to the right of W.
   II. S stands at extreme left end of the line. T stands to the extreme right end of the line. Only one person stands between S and U. Only one person stands between T and W.
14. **How far is point M from point K?**
   I. Point D is 5m to the South of Point P. Point M is 8m to the West of point D. Point S is 2.5m to the North of point M. Point O is 10m to the East of Point S. Point K is 2.5m to the South of point O.
   II. Point K is 10m to the East of point M. Point U is 8m to the West of point M. Point D is to the East of M. Point M is the midpoint of the lines formed by joining points U and D.

**Directions (Q. Nos. 15-19)** Each question consists of a question and two statements numbered I and II given below it. You have to decide whether the data given in the statements are sufficient to answer the questions. Read both the statements and answer the questions.

**Give answer**

(a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question
(b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question



(c) If the data either in Statement I alone or in Statement II alone is sufficient to answer the question
(d) If the data even in both statements together are not sufficient to answer the question
(e) If the data in both statements together are necessary to answer the question

15. **Among buildings J, K, L, M, N and O (each building is of different height), which is the tallest?**
   I. M is taller than J and O but shorter than K. N is taller than M but not the tallest. K is not the tallest.
   II. K is shorter than only two buildings. J is shorter than M and K but taller than O. N is taller than J.
16. **What is the direction of M with respect to K?**
   I. K is 8 m to the East of S. Q is to the North of S. P is 4 m away from Q. M is 2 m to the North of P.
   II. M is 12 m to the West of J. Q is 6 m to the South of M. K is to the South-East of Q.
17. **How is P related to M?**
   I. M is the wife of C. M and I are the only children of R. G is the only daughter of C. P is the granddaughter of R.
   II. G is married to L. M is mother-in-law of L. M is the only daughter of R and A. P is the grand child of R.
18. **Five people M, N, O, P and Q live on five different floors of a building but not necessarily in the same order. The lowermost floor of the building is numbered one, the one above that is numbered two and so on till the topmost floor is numbered five. How many people live between M and Q?**
   I. M lives on floor numbered three. Only one person lives between M and P. N lives on an odd numbered floor immediately above Q.
   II. O lives on an even numbered floor immediately below M. Only one person lives between O and Q. N lives on the topmost floor.
19. **Six people are sitting in two parallel rows containing three people each, in such a way that there is an equal distance between adjacent persons. In row-1, U, V and W are seated and all of them are facing South. In row-2, P, Q and R are seated and all of them are facing North. (Therefore, in the given seating arrangement, each member seated in a row faces another member of the other row). Who sits at extreme left end of row-2?**
   I. V sets at one of the extreme ends of the line. Only one person sits between Q and the one who faces V. P is an immediate neighbour of Q.
   II. Only one person sits between Q and R. W faces one of the immediate neighbours of R. V is an immediate neighbour of W.

**Directions (Q. Nos. 20-24)** Each of the following question below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and answer the questions.

**Give answer**

(a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question

(b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question
(c) If the data either in Statement I alone or in Statement II alone is sufficient to answer the question
(d) If the data in both Statements I and II together are necessary to answer the question
(e) If the data in both the Statements I and II together are not sufficient to answer the question

**20. How is 'also' written in a code language?**
I. 'he also show data' is written as 'sx fa mn ca' and 'now many person also' is written as 'zb ct sx ya' in that code language.
II. 'she visit the also' is written as 'sx lm nc ty' and 'she visit the always' is written as 'lm kc ty nc' in that code language.

**21. Point Q is in which direction with respect to Point P?**
I. Point P is in East of Point L. Point L is in North of Point M. Point M is in West of Point N. Point N is in South of Point O. Point O is in West of Point Q.
II. Point L is in West of Point P and North of Point M. Point M is in East of Point N which is South of Point O. Point Q is in East of Point O and North of Point L.

**22. Six persons viz. A, B, C, D, E and F are sitting on a circular table for lunch, who among them sits immediate left of F (If all the persons are facing towards the centre)?**
I. A sits third of right of F. One person sits between A and C. E sits third to left of C.
II. Only one person sits between E and D. F sits second to right of D. A sits third to left of F.

**23. Sharvan's birthday is in which of the following month in a year?**
I. Sharvan's mother correctly remembers that Sharvan's birthday will come after September but not in the month which has 30 days.
II. Sharvan's father correctly remember that Sharvan's birthday will not come in first and last month of the year.

**24. How far and in which direction is Point B with respect to Point A?**
I. Point G is 6 m to the East of Point A. Point C is 9 m to the North of Point G. Point F is 3 m to the West of Point C. Point B is 6 m away from Point F.
II. Point M is 8 m to the West of Point B. Point R is 8 m to the South of Point M. Point A is 11 m to the East of Point R. Point C is to the North-East of Point A.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (e) | **2.** | (b) | **3.** | (d) | **4.** | (d) | **5.** | (c) | **6.** | (d) | **7.** | (a) | **8.** | (d) |
| **9.** | (d) | **10.** | (e) | **11.** | (e) | **12.** | (d) | **13.** | (b) | **14.** | (c) | **15.** | (a) | **16.** | (b) |
| **17.** | (a) | **18.** | (c) | **19.** | (d) | **20.** | (c) | **21.** | (b) | **22.** | (d) | **23.** | (d) | **24.** | (b) |



# 8. Course of Action

Course of Action is the feasible step to be taken after an event happened or is about to happen.

In this type of questions, a situation is presented and some courses of action are suggested in the context of that situation. You have to identity the correct course of action, which either reduce the problem or improve the situation, which is created by that situation. Course of action should be feasible and should relate with the practical aspect of life.

## Basic Points to be Considered while Choosing a Correct Course of Action

To solve these questions, the candidates are advised to keep in mind the following important points

- Simple problem must have simple course of action and not a complicated one which may create more problems than to solve or reduce it.
- The correct course of action should be a positive step towards the solution of the problem rather harsh and undemocratic.
- If any course of action is followed with word 'only' it makes action weak.
- In most of the cases, a situation has more than one courses of action, but they are never exclusive to each other. So, the answer should be both follow or not either of them follows.

Examples given below, will give you a better idea about the types of questions asked in various competitive exams.

**Directions (Ex. 1 and 2)** Each Ex. given below has a statement followed by two courses of action numbered I and II. You have to assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the suggested courses of action logically follows for pursuing.

**Give answer**

(a) Only I follows
(b) Only II follows
(c) Only I and II follow
(d) Only II and III follow
(e) Either I or II follows

**Ex. 1 Statement**

If the retired professors of some institutes are also invited to deliberate on restructuring of the organisation, their contribution may be beneficial to the institute.

**Courses of Action**

I. Management may seek opinion of the employees before calling retired professors.
II. Management should involve experienced people for the systematic restructuring of the organisation.

**Sol.** (b) We know it very clearly that retired professors have lots of experience and can give valuable suggestions. Hence, management should involved such experienced people. Seeking permission from the employees is not the right course of action.

**Ex. 2 Statement**
Rahul has a deadline for a project in just two days and he has not yet started working on his project.

**Courses of Action**

I. He must immediately read a book on time management to avoid such problems in the future.

II. He must manage his time efficiently and start his project without delay.

III. He must plan a layout of his project first and then start following that layout.

**Sol.** (d) As the deadline of the project is two days, reading book on time management should not be the course of action as it does not help in completion of the project. Thus, his course of action should be to plan a layout of project, start following that layout without further delay and managing time efficiently.

**Ex. 3** Consider the following statements and courses of action and decide which course/courses of action logically follows/follow for pursuing.

**Statement:** Nuclear power cannot make a country secure.

**Courses of Action**

I. We should stop further increasing our nuclear power.

II. We should destroy out nuclear capability.

III. We should focus on improving diplomatic relations.

(a) Only I follows (b) Only II follows

(c) Only III follows (d) Both I and II follow

**Sol.** (c) Action I is not a good action, because nuclear power can be used in power generation. Destroying nuclear capability will raise another problem, so II is also not good. Action III is a good option to secure a country.

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-16)** Each question given below has a statement followed by two courses of action numbered I and II. 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. You have to assume everything in the statement to be true, then decide which of the two suggested courses of action logically follows for pursuing.

Give answer

(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



1. **Statement:** Four cases of pick pocketing were reported at one of the most renowned five star hotels last evening.

   **Courses of Action**

   I. The hotel staff should be instructed to be vigilant and report any suspicious person or activity.

   II. More CCTV cameras should be installed near the dining and reception areas of the hotel where these incidents took place.

2. **Statement:** Local villagers have reported that instances of illegal cutting of trees have increased over the last few months in the forest area.

   **Courses of Action**

   I. The local villagers should be encouraged to report any such activities in the future as well.

   II. Authorities should immediately look into the matter and put a stop to such illegal activities.

3. **Statement:** Most of the children in India are not able to get education, because they get employed to earn livelihood in their childhood only.

   **Courses of Action**

   I. Education should be made compulsory for all children upto the age of 14.

   II. Employment of children below the age of 14 yr should be banned.

4. **Statement:** Most of the development plans are on paper only.

   **Courses of Action**

   I. The incharges should be instructed to supervise the field work regularly.

   II. The supply of paper to such department should be cut short.

5. **Statement:** Annual results of school G are continuously falling from past three years as the school is unable to hire adequate number of teachers due to lack of funds.

   **Courses of Action**

   I. School G should increase the fees of students by 30% in order to generate funds for hiring new teachers.

   II. Classes of school G should be divided into two shifts and should be continued with the existing teachers.

6. **Statement:** Many villages face flood fury every year in the monsoon.

   **Courses of Action**

   I. Timely evacuation of the people is necessary.

   II. The government should take measures to control floods by building dams etc.

7. **Statement:** The police harass the common man.
**Courses of Action**
I. The government should take firm steps against the erring policeman.
II. The police force should be educated for public dealing.

8. **Statement:** School uniform is a burden on the poor parents.
**Courses of Action**
I. Poor parents should stop buying school uniform.
II. Schools can provide subsidy on school uniforms.

9. **Statement:** Trade Unions slow down the industrial production.
**Courses of Action**
I. Trade Unions should be banned.
II. Industry should employ persons on temporary basis.

10. **Statement:** People see tax as a burden and thus devise ways to underpay or avoid it altogether.
**Courses of Action**
I. Government should educate and inform citizens about the ways in which taxes help in development of the nation.
II. Tax rates should be increased so that the under-recovery in collection is compensated.

11. **Statement:** Despite repeated warnings to students and parents from the college, some students have finally not fulfilled the mandatory criteria of 75% attendance in order to appear for exams.
**Courses of Action**
I. The college should stop adhering to this particular criteria.
II. Either the parents or guardians of the defaulters should be called for a meeting.

12. **Statement:** The authorities of 'Emperor's Garden', a famous tourist spot in City F, which is open for public visit free of cost for two months in a year, have complained about the cleanliness issue in the garden and damage to property caused by the public.
**Courses of Action**
I. Authorities should restrict entry to a certain age group only.
II. All those found damaging the property should be penalised in monetary terms.

13. **Statement:** The sales of ball-point pens manufactured by company Lixus have gone down considerably ever since the same company introduced a gel-ink pen in the market.
**Courses of Action**
I. Ball-point pens should not be manufactured by Lixus any more.
II. Lixus should immediately withdraw all gel-ink pens from the market so as to force people to buy ball-point pens.



14. **Statement:** The police department has come under a cloth with recent revelations that atleast two senior police official are suspected to have been involved in the illegal sale of large quantity of weapons from the state police armoury.
**Courses of Action**
I. A thorough investigation should be ordered by the State Government to bring out all those who are involved in the illegal sales of arm.
II. State police armoury should be kept under Central Government's control.

15. **Statement:** In a competitive exam held across country Banimia, more than 8 lakhs candidates appeared. But, about 4000 candidates were found to be using unfair means, 75% of which were from State K of the country.
**Courses of Action**
I. Government of 'Banimia' should improve inspection and invigilation in all test centres of State K for all competitive exams.
II. From now on for any competitive exams in Banimia, any application from State K should not be entertained.

16. **Statement:** Most of the people looking for buying/renting properties these days complain of being taken to the same property by more than 6-7 brokers. So, even after contracting multiple agents, they end up having usually the same options.
**Courses of Action**
I. All the owners should strictly give the responsibility of their properties to only one broker
II. The brokers should be instructed to mandatorily disclose the list of all the properties they will be showing the customers on a particular day before taking them to the actual site.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (e) | **2.** | (e) | **3.** | (e) | **4.** | (a) | **5.** | (b) | **6.** | (b) | **7.** | (e) | **8.** | (b) |
| **9.** | (b) | **10.** | (a) | **11.** | (b) | **12.** | (b) | **13.** | (d) | **14.** | (a) | **15.** | (a) | **16.** | (e) |

# 9. Mathematical Reasoning

Mathematical reasoning involves the basis mathematical and arithmetic problems
Mathematical reasoning test is designed to test the ability of a candidate to s
the various Mathematical problems which are encountered in day to day life. To s
the problems on Mathematical reasoning, a candidate should have a knowledg
concepts of arithmetic or basic Mathematics.
*Example given below, will give you a better idea about the types of questions aske*
*various examinations.*

**Ex.1** The cost of four cycle tyres and three tubes is ₹ 720, whereas the cost of th
cycle tyres and four tubes is ₹ 610. What is the cost of a tube?

(a) ₹ 42 (b) ₹ 50 (c) ₹ 40 (d) ₹ 45

**Sol.** (c) Let cost of one cycle tyre be ₹ $x$ and cost of one tube ₹ $y$.

According to the question,

$$4x + 3y = 720$$

$$3x + 4y = 610$$

On multiplying eq. (i) by 3 and eq. (ii) by 4,

$$12x + 9y = 2160$$

$$\underline{-12x \pm 16y = -2440}$$

$$-7y = -280$$

$$\therefore \quad y = 40$$

Hence, the cost of a tube is ₹ 40.

**Ex. 2** If a number is multiplied by three-fourth of itself, then the value thus obtained
10800. What is that number?

(a) 210 (b) 180 (c) 120 (d) 160

**Sol.** (c) Let the number be $x$.

According to the question,

$$x \times \left( x \times \frac{3}{4} \right) = 10800 \Rightarrow \frac{3x^2}{4} = 10800$$

$$\Rightarrow \quad x^2 = \frac{10800 \times 4}{3} = 14400$$

$$\therefore \quad x = \sqrt{14400} = 120$$

**Ex. 3** The differene of the ages of Rohit and Axar is 12 yr. The ratio of their ages is 3 : 5.
The age of Axar is

(a) 32 yr (b) 24 yr (c) 28 yr (d) 30 yr

**Sol.** (d) Let present ages of Rohit and Axar be $3x$ and $5x$ yr, respectively.

According to the question,

$$5x - 3x = 12$$

## Multiple Choice Questions ▼

**Q 1.** David divides 78 by half and adds 11. What number he gets at the end?
a. 50 b. 44½ c. 167 d. 83½

**Q 2.** The sum of all the 3-digit numbers which are formed by the digits 1, 2 and 3 without repetition of digits, is
a. 1233 b. 1321 c. 1323 d. 1332
e. None of these

**Q 3.** The sum of Reena's and her father's age is 60 y and the difference between their ages is 36yr. What is Reena's father's age?
a. 58 yr b. 60 yr c. 48 yr d. 52 yr

**Q 4.** 12 yr old Sami is three times as old as his brother Vinay. How old will Sami be when he twice as old as Vinay?
a. 14 yr b. 16 yr c. 20 yr d. 18 yr

**Q 5.** A man climbing up a wall of 24 m high. He climbs 16 m in a day but slipped back by 3 m 40 cm in the evening. How far had the man reached on that day?
a. 11.4 m b. 12.6 m c. 12 m 40 cm d. 19 m 40 cm

**Q 6.** Two horses A and B run at a speed of 3 : 2 ratio in the first lap; during the second lap the ratio differs by 4 : 7; during the third lap the ratio differs by 8.9. What is the difference in ratio of speed altogether between the two horses?
a. 4 b. 1 c. 3 d. 2

**Q 7.** P is greater than Q by 60% and greater that R by 30%. The ratio of Q and R is:
a. 1 : 2 b. 2 : 1 c. 13 : 16 d. 16 : 11

**Q 8.** A certain sum of money was distributed among Darshana, Swati and Nivriti. Nivriti has ₹ 539 with her. If the ratio of the money distributed among Darshana, Swati and Nivriti is 5 : 6 : 7. What is the total sum of money that was distributed?
a. ₹ 1341 b. ₹ 1422 c. ₹ 1386 d. ₹ 1356

**Q 9.** Disha's salary is ₹ 3000 more than Pratima's salary. The ratio of Disha's to Pratima's salary is 17 : 15, respectively. What is the salary of Pratima?
a. ₹ 22500 b. ₹ 26750 c. ₹ 25500 d. ₹ 27250

**Q 10.** John used to buy petrol at the rate of ₹ 80 per litre till last month. Now, he buys it at the rate of ₹ 85 per litre. By what percentage did the petrol price increase as compared in last month?
a. 6.25% b. 8.35% c. 5.5% d. 10%

**Q 11.** The total of the ages of 4 persons is 86 yr. What was their average age, 4 yr ago?
a. 20.5 yr b. 19.5 yr c. 20 yr d. 17.5 yr

**Q 12.** The sum of the present ages of Asma and her grandfather is 80 yr. 10 yr from now, Asma's age will be one-fourth of her grandfather's age. What is Asma's present age?
a. 16 yr b. 12 yr c. 20 yr d. 10 yr



**Q 13.** A plastic toy costs ₹ 7. A plastic spoon costs ₹ 5. X spends ₹ 38 on these plastic items. Find the number of plastic toys he/she purchased.
a. 3 b. 4 c. 5 d. 2

**Q 14.** If it takes two workers, working separately but at the same speed, 2 h and 40 min to complete a particular tasks, about how long will it take one worker, working at the same speed, to complete the same task alone?
a. 1 h 20 min b. 4 h 40 min c. 5 h d. 5 h 20 min

**Q 15.** Some and his friend Rahul went for shopping. Sonu had ₹ 500 with him while Rahul had ₹ 240. Sonu spent twice as much as Rahul on shopping. Now, Sounu has three times as much money as is left with Rahul. How much money did Sonu spend?
a. ₹ 220 b. ₹ 60 c. ₹ 440 d. ₹ 120

**Q 16.** Mohit and Sudesh bought pens and notebooks from the same shop. Mohit bought 3 pens and 6 notebooks by paying an amount of ₹ 180. Sudesh bought 5 pens and 2 notebooks by paying an amount of ₹ 116. How much did Mohit spend on buying notebooks?
a. ₹ 84 b. ₹ 138 c. ₹ 122 d. ₹ 115

**Q 17.** The ratio of present ages of Sumit and Amit is 3 : 4. If the age of Sumit 20 yr hence will be 62 yr, then what is the present age of Amit?
a. 56 yr b. 64 yr c. 60 yr d. 52 yr

**Q 18.** In a company, 60% workers are males. If the number of female workers in the company is 800, what is the number of male workers in the company?
a. 1600 b. 1400 c. 1900 d. 1200

**Q 19.** In a class of 68 students, 34 students participated only in debate and 8 students participated in both quiz and debate. If every student of the class has participated in at least one of these two competitions, then how many students participated in quiz?
a. 26 b. 34 c. 30 d. 22

**Q 20.** Hemant buys a dozen eggs for ₹ 5.50 per egg. While carrying them, two eggs get wasted when they fall down and get damaged. He sells the balance eggs at ₹ 7.70 per egg. Find the net profit earned by him in the overall deal.
a. ₹ 11.00 b. ₹ 15.40 c. ₹ 15.00 d. ₹ 10.70

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (c) | 2. | (d) | 3. | (c) | 4. | (b) | 5. | (b) | 6. | (c) | 7. | (c) | 8. | (c) |
| 9. | (a) | 10. | (a) | 11. | (d) | 12. | (d) | 13. | (b) | 14. | (d) | 15. | (c) | 16. | (b) |
| 17. | (a) | 18. | (d) | 19. | (b) | 20. | (a). | | | | | | | | |

# 10. Decision Making

Decision making test is a process of checking a candidate's qualifications and necessary conditions to fulfil the given criteria for job/promotion/admission in college etc.

In these type of questions, a set of necessary qualifications and conditions required to be fulfilled by the candidate for certain vacancies in job, promotion, etc. along with the bio-data of the candidates, who have applied for the same posts. You are required to match personal data of a person with the eligibility requirements. Following examples will illustrate the type of questions, we may come across.

**Directions** (Illustrations 1-5) : *Study the following information carefully and answer the questions given below.*

Following are some conditions for short-listing candidates for the interview for management trainees in an organisation.

**The candidate must**

(i) not less than 21 yr and more than 28 yr as on 1st November, 2017.
(ii) have secured atleast 60% marks in graduation.
(iii) have secured atleast 65% marks in the preliminary selection examinations.
(iv) have secured atleast 55% marks in the final selection examinations.
(v) be ready to join work immediately after the interview.

*In case of a candidate, who fulfils all other criteria except*

(A) at (iv) but has secured more than 72% marks in preliminary selection examination, his/her case is to be referred to Deputy General Manager.

(B) at (ii) but has secured atleast 65% marks in post-graduation, his/her case is to be referred to General Manager. In each of the questions given below. You have to study the information provided with reference to the conditions given above and decide whether the candidate is to be called for an interview or some other course of action is to be taken.

You are not required to assume anything other than the information provided to you in each question. All these cases are given to you as on 1st November, 2017. Now, read the information provided in each question and decide the courses of action with regard to each candidate.

**Give answer**

(a) if the candidate is to be called for an interview
(b) if the case is to be referred to General Manager
(c) if the candidate will not be called for an interview
(d) if the data provided are not sufficient to take a decision
(e) if the case is to be referred to Deputy General Manager

**Ex. 1.** Neelam Srivastava has secured 75% marks in the preliminary selection examination. She was 22 yr old as on 5th December, 2013. She has secured 65% and 60% marks in the final selection examination and in graduation, respectively. She is ready to join immediately after the interview.



**Ex. 2.** John D'costa has secured 54% marks in the final selection examination. He has secured 75% marks each in graduation and preliminary examination. He is ready to join work immediately after the interview. He was 22 yr old as on 4th August, 2014.

**Ex. 3.** Subhash Malhotra was 26 yr old as on 9th September, 2015. He has secured 75% marks each in graduation, preliminary and final selection examination. He is ready to join work immediately after the interview.

**Ex. 4.** Rahul Biswas was born on 21st January, 1990. He is ready to join work immediately after the interview. He has secured 70% marks in all the graduation, preliminary and final selection examination.

**Ex. 5.** Sudha Nagpal has secured 75% and 65% marks in the graduation and preliminary selection examination, respectively.

She is ready to join immediately after the interview. She stood 3rd in the final selection examination. She was born on 2nd July, 1994.

**Solutions:** (Illustrations 1-5) All the informations can be summarised as given in the table

| Name | Conditions fulfilled | | | | | | |
|---|---|---|---|---|---|---|---|
| | (i) | (ii) | (B) | (iii) | (iv) | (A) | (v) |
| Neelam | ✓ | ✓ | — | ✓ | ✓ | — | ✓ |
| John D'costa | ✓ | ✓ | — | ✓ | ✗ | ✓ | ✓ |
| Subhash | ✗ | ✓ | — | ✓ | ✓ | — | ✓ |
| Rahul | ✓ | ✓ | — | ✓ | ✓ | — | ✓ |
| Sudha | ✓ | ✓ | — | ✓ | — | | ✓ |

**1.** (a) Neelam Srivastava satisfies all the conditions. Therefore, she may be called for the interview.

**2.** (e) John D'costa satisfies all the conditions except (iv) but he fulfils the sub-condition (A). So, his case is to be referred to the Deputy General Manager.

**3.** (c) Subhash Malhotra does not satisfy condition (i). Hence, he should not be called for the interview.

**4.** (a) Rahul Biswas satisfies all the conditions. Hence, he should be called for the interview.

**5.** (d) Sudha, Nagpal's final selection marks are not mentioned in the given question. So, data provided is not sufficient to take a decision.

## Multiple Choice Questions ▼

**Directions (Q. Nos. 1-5):** *Study the following information carefully and answer the questions given below.*

Following are the conditions for selecting Accounts Officer in an organisation. The candidate must

(i) be atleast 21 yr and not more than 26 yr as on 01.11. 2011.
(ii) be a Commerce graduate (B.Com) with atleast 55% aggregate marks.

(iii) have work experience of atleast 2 yr in the Accounts department of an organisation.
(iv) have secured atleast 50% marks in the selection process.

*In the case of a candidate who fulfils all the conditions except*

**(A) at (i) above, but atleast 21 yr old and not more than 28 yr old and has work experience of 5 yr as Accounts Assistant in an organisation, his/her case is to be referred to GM-Accounts.**

**(B) at (ii) above, but has secured atleast 50% aggregate marks in graduation and has secured atleast 55% marks in the selection process, his/her case is to the referred to VP-Accounts.**

**In each question below, details of one candidate are provided. You have to take one of the following courses of actions based on the conditions given above and the information provided in each question and mark the number of that course of action as your answer. You are not required to assume anything other than the information provided in each question. All these cases are given to you as on 01.11.2011.**

**Give answer**

(a) if the case is to be referred to GM-Accounts
(b) if the case is to be referred to VP-Accounts
(c) if the candidate is to be selected
(d) if the candidate is not to be selected
(e) if the data provided are inadequate to take a decision

**Now, read the information provided in each question and mark your answer accordingly.**

1. Umesh Choksi was born on 25th November, 1989. He has secured 60% aggregate marks in B. Com and 65% marks in the selection process. He has been working in the Accounts department of an organisation for the past 3 yr.
2. Pratibha Kale was born on 6th June, 1988. She has secured 60% aggregate marks in B.Com and 49% marks in the selection process. She has been working in the Accounts department of an organisation for the past 3 yr.
3. Arun Patil has secured 55% aggregate marks in graduation. He has been working for past 4 yr in the Accounts department of an organisation. He has secured 50% marks in the selection process. He was born on 12th July, 1988.
4. Parbha Dixit was born on 18th April, 1985. She has been working as Accounts Assistant in an organisation for the past 5 yr. She has secured 60% aggregate marks in B.Com. and 55% marks in the selection process.
5. Amul Verma has secured 50% aggregate marks in B.Com and 60% marks in the selection process. He has been working in the Accounts department of an organisation for past 4 yr. He was born on 2nd January, 1987.



**Directions (Q. Nos. 6-10)** : *Read the following information carefully and answer the questions given below.*

A company decided to appoint Content Manager (CM) to give a new impetus to its business. Following are the criteria laid down by the company.

**The candidate must have**

(i) a Graduate degree from a recognized university with at least 65% marks.
(ii) qualified in at least 5 written examinations of Bank PO.
(iii) obtained at least 60% marks in the written test (total marks = 200) conducted by the company.
(iv) obtained at least 40% marks out of 75 marks in the interview for the above post conducted by the company.
(v) a working knowledge of computers.
(vi) completed 30 yr of age as on 14th January, 2012.

*However, in case of a candidate who fulfils all these criteria except*

**(A) (i) above, but is a graduate, is to be referred to the Director of the company.**

**(B) (iii) above, is to be referred to the Assistant Vice President of the company. Based on the above criteria and the information given in each of the following cases, you have in take decision. You are not required to assume anything. In case you find that the given data is insufficient to make a decision, given 'data inadequate' as your answer. The cases are being given to you as on 14.01.2012.**

**Give answer**

(a) if the candidate is to be selected as CM
(b) if the candidate is not to be selected as CM
(c) if the case is to be referred to the Director of company
(d) if the case is to be referred to the Assistant vice President of the company
(e) if the data are inadequate to take any decision

6. Surbhi Gaurav, was born on 12th January, 1981, has done her graduation with 67% marks. It was the fifth interview for her when she appeared before the interview board constituted for Union Bank of India She has a working knowledge of computers. She got 121 marks and 38 marks in the written examination and interview respectively, conducted by the company.
7. Vineet Pehal has a working knowledge of computers. He got 125 marks and 32 marks in the written examination and interview respectively, conducted by the company. When he appeared before the interview board for PO for Bank of India, it was his sixth interview for Bank PO. He performed a good dance on 10th January, 2012, on the eve of the birthday of his sister, who is 8 yr younger than him.
8. Malik Aanand a talented working computer engineer, is 31 yr of age. He has already qualified six exams for Bank PO. He is a graduate with 65% marks. He

got 60% marks in the interview and 40% marks in the written test conducted by the company for CM.

9. Shobha Vijay has a working knowledge of computers. She is a graduate with 65% marks. She has qualified five written examinations of Bank PO. She has obtained 40% marks and 60% marks in interview and written examinations respectively, conducted by the company for CM. For the last three years her age has been more than 18.

10. Alankrita Mangal is graduate with 65% marks. She has obtained 30 marks in the interview and 123 marks in the written examination conducted by the company, for CM. She is 32 yr old and possesses working knowledge of computers. She has given more than five interview of Bank PO exam.

**Directions (Q. Nos. 11-15):** Study the following information carefully to answer these questions. Following are the conditions stipulated by XYZ Companies for recruitment of Trainees Engineers.

**The candidate must**

(i) be an Engineering graduate with atleast 60% marks.
(ii) be not less than 21 yr and not more than 25 yr of age as on 01.05.2017.
(iii) have passed the selection test with atleast 55% marks.
(iv) be willing to pay a deposit of ₹ 50000 to be refunded on completion of training.

However, if a candidate fulfils all the above mentioned criteria except

**(A) at (i) but has appeared to the last semester examination and has obtained an aggregate of minimum 65% marks in first seven semesters his/her case may be referred to VP of the company.**

**(B) at (iv) but is willing to pay an amount atleast ₹ 25000 and has obtained atleast 70% marks in Engineering degree; his case may be referred to the General Manager of the company.**

**In each of the following question, details of a candidate are given as regards his/her candidature. You have to read the information provided and decide his/her status based on the conditions given above and the information provided. You are not required to assume anything other than the information provided in each of the following questions. All these cases are given to you as on 01.05.2017.**

**Give answer**

(a) if the candidate is to be selected
(b) if the case is to be referred to General Manager'
(c) if the case is to be refered to the VP
(d) if the data provided are not adequate to take a decision
(e) if the candidate is not to be selected

11. Sachin who has just completed 23 yr age passed out degree in Civil Engineering with 70% marks. He has cleared the selection test with 61% marks. He is willing to pay the amount of ₹ 25000 only will not be able to pay ₹ 50000.



12. Anjali is an IT Engineer passed out in 2010 with 52% marks. After getting the Engineering degree, she has done MBA with specialisation in finance. She has cleared the selection test with 60% marks. She can pay the deposit of ₹ 50000. Her date of birth is 15th September, 1993.

13. Mohan Rao is an Electronics Engineer and passed out in 2015 with 66% marks. He has passed the selection test with 59% marks and is willing to pay the required amount of deposit.

14. K. Shiv Kumar is a student of Mechanical Engineering and has appeared for the last semester examination. Results of the last semester examinations are expected in June 2017. He is expecting to score 65% marks in the last semester as his aggregate percentage of the first seven semesters is 67%. He has passed the selection test with 60% marks and has no problem in paying the amount of ₹ 50000 as deposit. He is 22 yr old at present.

15. Rajeev Andhare has appeared for the last semester of Engineering degree examination and is hoping to score atleast 70% marks. His aggregate score upto first seven semesters is 72%. He has just completed 21 yr of age. He has scored 63% marks in the selection test and is ready to pay an amount of ₹ 50000 as deposit.

## ANSWERS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (c) | **2.** | (d) | **3.** | (e) | **4.** | (a) | **5.** | (b) | **6.** | (e) | **7.** | (e) | **8.** | (d) | | |
| **9.** | (e) | **10.** | (a) | **11.** | (b) | **12.** | (e) | **13.** | (d) | **14.** | (c) | **15.** | (c) | | | | |

## 11. Cause and Effect

**Cause** is the reason of an event that has occured and **Effects** are the outcomes of a cause.

The necessary condition for an event to occur is a cause which supplements an event to occur. For a cause to be valid, it must be either sufficient or necessary.

1. Necessary Condition for an event to take place is that condition without which the event will not occur.

2. Sufficient Condition for an event to take place is that condition under whose presence event must occur.

e.g. For life to exist on earth we require (a) air (b) water (c) food.

Condition (a), (b) and (c) together makes sufficient conditions for life to exist on Earth but individually they are necessary conditions for life to exist on Earth.

Therefore, we can say that there may be more than one necessary conditions for the occurrence of an event and all those necessary conditions must be included in the sufficient conditions.

## Different Types of Causes

Immediate Cause; An immediate cause is one which occurs immediately befor
the effect. e.g., I slapped Rohan after that he slapped me.
Here, the immediate cause is "I slapped Rohan".

**Principal Cause:** It is the most important reason behind the effect. e.g. Rohit fail
in annual exam because he does not study. Here, the principal cause is 'he does no
study'.

**Common Cause:** Two effects given in two statements may be caused by a thir
unmentioned event which is called the common cause of the given events. e.g.

**Statement 1.** Global warming is increasing.

**Statement 2.** The glaciers are melting. Here, the common cause will be th
"amount of carbon dioxide" is increasing.

## Types of Questions

*There are mainly two types of questions, which are generally asked in variou
competitive examinations.*

## Type 1

**Statement and Direction Based Questions**

In this type of questions, two statements are given and the candidate has t
identify whether they are independent causes or effects of independent causes or a
common cause etc.

**Directions (Ex. 1-3):** *In the given questions, there are given two statements A and
B. These statements may be either independent causes or may be effects of independen
causes or a common cause. One of these statements may be the effect of the othe
statement. Read both the statements and decide which of the following answer choices
correctly depicts the relationship between these two statements.*

**Give answer**

(a) If Statement A is the cause and Statement B is the effect
(b) If Statement B is the cause and Statement A is the effect
(c) If both the Statements A and B are independent causes
(d) If both the Statements A and B are effects of independent causes
(e) If both the Statements A and B are effects of common cause

**Ex. 1.** A. Ahmed is a healthy boy.

B. His mother is very particular about the food he eats.

**Ans.** Since, Ahmed's mother take care of what he eats, Ahmed has a good health.
Hence, (B) is the cause and (A) is its effect. Therefore, option (b) is correct.

**Ex. 2.** A. The staff of airport authorities called off the strike they were observing
in protest against privatisation.

B. The staff of airport authorities went on strike, anticipating a threat to their
jobs.

**Ans:** (d) Clearly, calling of the strike and going on strike are events that may not
be backed by the same cause. Therefore, they must have been effects triggered by
separate independent causes. Therefore option (d) is correct.

3. A. The prices of fruits have dropped substantially during the last few days.
   B. The prices of foodgrains have increased substantially during the last few days.
4. A. The road traffic between the two towns in the state has been disrupted since last week.
   B. The rail traffic between the two towns in the state has been disrupted since last week.
5. A. Worldwide recession has created uncertainty in job market.
   B. Many people are opting for change from private sector to public sector.
6. A. A large number of employees could not report to the duty on time.
   B. Police had laid down barricades on the road to trap the miscreants.
7. A. The farmers have decided against selling their Kharif crops to the Government agencies.
   B. The Government has reduced the procurement-price of Kharif crops starting from last month to the next six months.
8. A. There has been mass recruitment of IT professionals by Indian IT companies.
   B. Many developed countries are increasingly outsourcing IT related functions to India and China.
9. A. The price of aircraft fuel has risen during the past few months.
   B. Many passenger airlines in India have been forced to cut their air fares by about 10%.
10. A. The Government has decided to increase the prices of LPG cylinders with immediate effect.
    B. The Government has decided to increase the prices of Kerosene with immediate effect.
11. A. Most of the students enrolled themselves for the educational tour scheduled for next month.
    B. The school authority cancelled the educational tour scheduled for next month.
12. A. The Reserve Bank of India has recently put restrictions on few small banks in the country.
    B. The small banks in the private and cooperative sector in India are not in a position to withstand the competitions of the bigger ones in the public sector.



13. A. The braking system of the tourist bus carrying 40 passengers failed while negotiating a stiff climb on a hilly road.
    B. The tourist bus fell into the gorge killing at least ten passengers and seriously injuring all the remaining.
14. A. The State Government has decided to boost English language education in all the schools from the next academic year.
    B. The level of English language of the school students of the State is comparatively lower than that of the neighbouring states.

**Directions (Q. Nos. 15-20):** In each of these questions, two statements marked as I and II are provided. These may have a cause and effect relationship or may have independent causes or be the effects of independent causes. Read both the statements and give answer.

(a) If Statement I is cause and Statement II is effect
(b) If Statement II is cause and Statement I is effect
(c) If Statement I and II both are independent causes
(d) If Statement I and II both are the effect of independent causes
(e) If both Statements are effect of common cause

15. **Statement I.** There has been an increase in the underground water level column at all places in Delhi due to the last year's monsoon rains.
    **Statement II.** Many trains had to be cancelled last year due to water-logging on the railway tracks.
16. **Statement I.** The prices of sugar had risen very sharply in Indian markets last year.
    **Statement II.** The Government imported large quantities of sugar as per trade agreements with other countries last year.
17. **Statement I.** The prices of petrol and diesel in the domestic market have remained unchanged for the past few months.
    **Statement II.** The crude oil prices in the international market have gone up substantially in the last few months.
18. **Statement I.** It is the bounden duty of each member of the civil society to control the air pollution by contributing their best in this endeavour to safeguard the health of their countrymen.
    **Statement II.** The alarming air pollution in our country is causing asthma cases to constantly multiply.

19. **Statement I.** The Government has recently fixed the fees for professional courses offered by the unaided institutions which are much lower than the fees charged last year.

**Statement II.** The parents of the aspiring students launched a severe agitation last year protesting against the high fees charged by the unaided institutions.

20. In this question there are two Statements A and B. These statements may either be independent causes or effects of independent causes or a common cause. One of these statements may be the effect of the other statement. Read both the statements carefully and decide which of the given answer choices correctly depicts the relationship between these two statements.

A. Despite' giving their best performance, more than 100 employees of XYZ Pvt. Ltd. have been laid off.

B. More than 40% employees of XYZ Pvt. Ltd. who have crossed the age of 50 yrs have been asked to take voluntary retirement from their services.

(a) Statement A is the cause and statement B is its effect
(b) Statement B is the cause and statement A is its effect
(c) Both statements are effects of independent causes
(d) Both statements are independent causes
(e) Both statements are effects of some common cause

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (b) | **2.** | (b) | **3.** | (d) | **4.** | (e) | **5.** | (a) | **6.** | (b) | **7.** | (b) | **8.** | (b) |
| **9.** | (d) | **10.** | (e) | **11.** | (c) | **12.** | (b) | **13.** | (a) | **14.** | (b) | **15.** | (e) | **16.** | (a) |
| **17.** | (d) | **18.** | (b) | **19.** | (b) | **20.** | (e). | | | | | | | | |



# Unit-III

## 1. Introduction to Computer

Computer is an automatic electronic device that takes input from the user, processes these data under the control of a set of instructions (called a program) and gives the result (output) for future use. It can process both numerical and non-numerical (arithmetic and logical) calculations.

### Functions of Digital Computer

A typical modern computer uses LSI chips.

The basic components of a modern digital computer are:

There are input devices, output devices, central processing units (CPUs), storage devices and memory that perform different functions.

Following are the main functions of computer:

**1. Data input:** Data input devices are raw information entered into the computer. It is a collection of letters, numbers, images etc.

**2. Process:** Process is the handling of data according to the instructions given. It is completely the internal process of the computer system, which operates the work of digital computer by CPU.

**3. Output:** Output is the processed data given by the computer after data processing. Output is also called result.

**4. Storage:** Stores the processed data (results) in storage devices for future use or storage.

### Generations of Computer

In the study of computer, generations of computer mean "growth in computer technology". In fact generations of computer describes development over time. We can divide the sequence of this development into six generations:

| S. No. | Generation of Computer | Time Period of Computer | Based on Device |
|---|---|---|---|
| 1. | First Generation | 1946 to 1956 | Vacuum Tubes |
| 2. | Second Generation | 1956 to 1964 | Transistors |
| 3. | Third Generation | 1964 to 1971 | Integrated Circuits (IC's) |
| 4. | Fourth Generation | 1971 to 1990 | Microprocessors |
| 5. | Fifth Generation | 1990 to 1995 | Artificial Intelligence |
| 6. | Sixth Generation | 1995 to present | Under Development |

**History of Computers**

Computer is not the creation of one day, rather it took a long period for the development of modern computer.

History of computer is described in this table:

| Inventions | Inventors | Characteristics | Applications |
|---|---|---|---|
| Abacus 1602 | China | ▪ First mechanical calculating device.<br>▪ A horizontal rod represents the one, tens, hundred etc. | ▪ Used for addition and subtraction operations.<br>▪ Calculation of square roots can also be performed. |
| Napier's Bones 1617 | John Napier (Scotland) | ▪ Three dimensional structure.<br>▪ Holding numbers from 0 to 9 only.<br>▪ Represent graphical structure of calculating result.<br>▪ Technology used for calculation called **Rabdologia.** | ▪ Perform multiplication of numbers. |
| Pascaline 1642 | Blaise Pascal (France) | ▪ First mechanical adding machine.<br>▪ This machine worked on the principle of odometer and watch.<br>▪ Mainly designed with regard to the pressure of liquid. | ▪ Perform addition and subtraction of two numbers. |
| Jacquard's Loom 1801 | Joseph Marie Jacquard (France) | ▪ It was first mechanical loom.<br>▪ Used punched card for the sequence of operation. | ▪ Simplified the process of textiles. |
| Analytical Engine 1837 | Charles Babbage (London) | ▪ First general purpose computer.<br>▪ Stored program in the form of 'pegs' also called **barrels.** | ▪ It was a decimal machine used sign and magnitude for representation of a number. |
| Tabulating Machine 1890 | Herman Hollerith (America) | ▪ It used punched cards for reading numbers.<br>▪ it was the first electromechanical machine. | ▪ It was used in the 1890 census. |
| MARK-1 1944 | Howard Aiken (America) | ▪ Consists of interlocking panels of small glass, counters, switches and control circuits.<br>▪ Data can be entered manually. | ▪ Mainly used in the war effort during World War-II.<br>▪ Magnetic drums are used for storage. |
| ENIAC 1946 | JP Eckert and JW Mauchly (America) | ▪ It is a combination of twenty accumulators.<br>▪ First electronic digital computer. | ▪ Used for weather prediction, atomic energy calculation and other scientific uses.<br>▪ Used in IBM and other. |
| EDVAC 1947 | John Von Neumann (America) | ▪ Electronic digital computer. | ▪ Logical design of a computer with a stored program. |



| | | | |
|---|---|---|---|
| EDSAC 1949 | Maurice Wilkes (America) | ▪ It was the first computer which provided **storage capacity.**<br>▪ First computer program was run on machine. | ▪ Capable of storing instructions and data in memory.<br>▪ Used mercury delay lines for memory, vacuum tubes for logic. |
| UNIVAC 1951 | J. Presper Eckert and John Mauchly (America) | ▪ First general purpose electronic computer with large amount of input and output. | ▪ Used magnetic tapes as input and output.<br>▪ Use of account work. |
| IBM-650 Computer 1953 | IBM Company | ▪ Provided input/output units converting alphabetical and special characters to two-digit decimal code. | ▪ Payroll processing<br>▪ Oil refinery design<br>▪ Market research analysis. |

## Types of Computer

Computer can be classified into many types on the basis of their function, purpose or/and size. In fact, it is not possible to classify computers directly as their area of development is very wide. For the convenience of study, computer can be divided into six main types:

(1) Depending on the applications
(2) On the basis of purpose
(3) Depending on the size
(4) On the basis of functionality
(5) Depending on the brand
(6) Depending on the model

**1. Types of Computer on the Basis of Applications:** Although there are innumerable applications of computer, out of which on the basis of their applications there are following types of computer:

(i) Analog computer
(ii) Digital computer
(iii) Hybrid computer

**2. Types of Computer Based on Purpose:** Depending on the objectives, two classes of computers can be possible:

(i) General purpose computer
(ii) Special purpose computer

**3. Types of Computer on the Basis of Size and Capacity:**

There are four categories of computers on the basis of size and capacity:

(i) Microcomputer
(ii) Minicomputer
(iii) Mainframe computer
(iv) Supercomputer

**4. Types of Computer by Brand:**

(i) IBM PC
(ii) Apple Macintosh

## Multiple Choice Questions ▼

1. The earliest calculating device is .....
(a) calculator (b) abacus
(c) difference engine (d) analytical engine

2. Tabulating machine was the first electromechanical machine developed by
(a) Herman Hollerith (b) Howard Aiken
(c) Blaise Pascal (d) John Napier

3. Small and cheap computers built into several home appliances are of which type?
(a) Mainframes (b) Mini Computers
(c) Micro computers (d) None of these

4. Desktop and personal computers are also known as .....
(a) supercomputers (b) servers
(c) mainframes (d) microcomputers

5. Computers that are portable and convenient to use for users who travel are known as .....
(a) supercomputers (b) minicomputers
(c) mainframe computers (d) laptops

6. Desktop computers, laptop computers, tablets and smartphones are different types of
(a) supercomputers (b) mainframe computers
(c) microcomputers (d) minicomputers

7. In the context of digital computer, which of the following pairs of digits is referred to as binary code?
(a) 3 and 4 (b) 0 and 1
(c) 2 and 3 (d) 1 and 2

8. A central computer that holds collection of data and programs for many PCs, workstations and other computers is a
(a) supercomputer (b) minicomputer
(c) Laptop (d) server

9. In 1991, India's first indigenous supercomputer named ..... was developed by Vijay P. Bhatkar.
(a) Prayas 3000 (b) Prayog 2000
(c) Param 8000 (d) Pragati 5000

10. Who among the following is called the father of supercomputing?
(a) Ken Thompson (b) Alan Perlis
(c) Seymour Cray (d) Vint Gerf



11. India's fastest and first multipetaflops supercomputer named Pratyush was unveiled at
(a) Indian Space Research Organisation
(b) Indian Institute of Science, Bangalore
(c) Indian Institute of Tropical Meteorology, Pune
(d) Indian Institute of Technology, New Delhi

12. Second generation computers can be characterised largely by their use of
(a) integrated circuits (b) vacuum tubes
(c) microprocessors (d) transistors

13. Integrated circuits of ICs were started to be used from which generation of computers?
(a) First generation (b) Second generation
(c) Third generation (d) Fourth generation

14. First supercomputer developed in India is
(a) PARAM (b) CRAY-1
(c) PARAM ISHAN (d) EPRAM

15. The ..... computer is the most common type of computer. It is used to process information with quantities usually using the binary number system.
(a) Hybrid (b) Digital
(c) Analog (d) Complex

16. Calculator works on which type of computer's work method?
(a) Hybrid computer (b) Analog computer
(c) Digital comptuer (d) None of the above

17. Which of the following computer is mainly related to convert analog output into digital form?
(a) Digital computer (b) Analog computer
(c) Hybrid computer (d) Mainframe computer

18. First generation computers were based on .....
(a) transistors (b) conductors
(c) ICs (d) vacuum tubes

19. Analytical engine developed by
(a) Blaise Pascal (b) Charles Babbage
(c) Dennis Ritchie (d) Alan Turing

20. PCs are considered fourth generation and contain
(a) information (b) data
(c) vacuum tubes (d) microprocessors

21. Fifth generation computers do not have
(a) speech recognition (b) artificial intelligence
(c) very large scale integration (d) vacuum tubes

22. Pratyush is ..... fastest supercomputer in the world.
(a) first (b) second
(c) third (d) fourth

**23. Example of super computer is**
(a) CRAY-2 (b) CRAY XMP-24 (c) Tianhe-2 (d) All of these.

**24. Which of the following is a supercomputer developed by India?**
(a) Param Yuva 2 (b) Onshape (c) Venngage (d) Pixir.

**25. Which type of computer is used in automatic aircraft landing?**
(a) General purpose computer (b) Supercomputer
(c) Special purpose computer (d) Microcomputer.

**26. Which of the following is the smallest and fastest computer imitating brain working?**
(a) Supercomputer (b) Quantum computer
(c) Param-10000 (d) IBM chips.

**27. Who among the following created the Electronic Discrete Variable Automatic Computer (EDVAC) with a memory to hold both, a stored program as well as data?**
(a) Thomas H Flowers (b) Arthur Samuel
(c) Bletchley Park (d) John Von Neumann.

**28. The first computer which provides storage is**
(a) EDSAC (b) EDVAC (c) ENIAC (d) ACE.

**29. Name the first general purpose electronic computer.**
(a) ADVAC (b) ADSAC (c) ENIAC (d) EDVAC.

**30. Palmtop computer is also known as .....**
(a) personal computer (b) notebook computer
(c) table PC (d) handheld computer.

**31. Which of the following is a small microprocessor based computer designed to be used by one person at a time?**
(a) Netbook (b) Supercomputer
(c) All-in-one (d) Personal computer.

**32. Which of the following options correctly expresses the meaning of the term 'PCs'?**
(a) Independent computers for all working staff
(b) Personal computers widely available to individual workers with which they can access information from layer systems and increase their personal productivity
(c) Packed computers system formed by joining together of various computer terminals
(d) Computer manufactured by the Pentium Company.

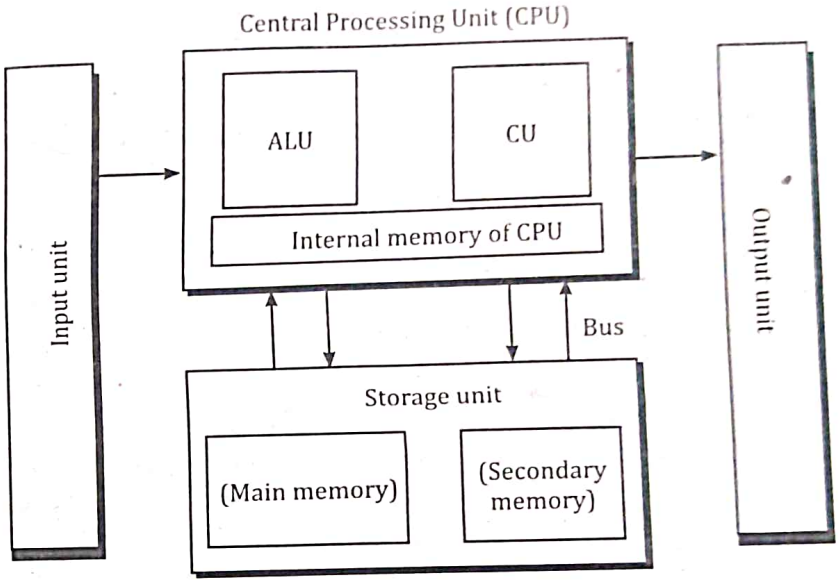
## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (b) | 2. | (a) | 3. | (c) | 4. | (d) | 5. | (d) | 6. | (c) | 7. | (b) | 8. | (d) |
| 9. | (c) | 10. | (c) | 11. | (c) | 12. | (d) | 13. | (c) | 14. | (a) | 15. | (b) | 16. | (c) |
| 17. | (c) | 18. | (d) | 19. | (b) | 20. | (d) | 21. | (d) | 22. | (d) | 23. | (d) | 24. | (a) |
| 25. | (c) | 26. | (b) | 27. | (d) | 28. | (a) | 29. | (a) | 30. | (d) | 31. | (d) | 32. | (b). |



## 2. Computer Architecture

Computer architecture deals with the functional behaviour of a computer of a computer system as viewed by a programmer. It can also be described as the logical structure of the system unit that housed electronic components. The first computer architecture was introduced in 1970 by John Von Neumann.




**Block diagram of digital computer**

### Components of Computer

1. Input Unit
2. Output Unit
3. Central Processing Unit
4. Memory Unit

**Note :** System unit is a metal or plastic case that holds all the physical part of the computer. The components that process data are located in it.

### Input Unit

The computer accepts coded information through input unit by the user. This unit is used to give required information to the comptuer. For example, keyboard, mouse etc.

*An input unit performs the following functions*

- It accepts the instructions and data from the user.
- It converts these instructions and data to computer acceptable format.
- It supplies the converted instructions and data to the computer system for further processing.

**Output Unit**

This unit sends the processed result to the user. It is mainly used to display the desired result to the user as per input instructions.

For example, monitor, printer, plotter, etc.

*The following functions are performed by an output unit*

- It accepts the results produced by the computer which are in coded form and hence cannot be easily understood by user.
- It converts these coded results to readable form which convenient to users.
- It produces the converted results to the user.

**Central Processing Unit (CPU)**

Central Processing Unit is often called the **brain of computer**. The CPU is fabricated as a single Integrated Circuit (IC) and is also known as **microprocessor**.

It consists a set of registers, arithmetic logic unit and control unit, which together interpret and execute instructions in assembly language.

*The primary functions of the CPU are as follows*

- The CPU transfers instructions and input data from main memory to registers.
- The CPU executes the instructions in the stored sequence.
- When necessary, CPU transfers output data from registers to main memory.

A CPU controls all the internal and external devices and performs arithmetic and logic operations.

*The CPU consists of following main sub-systems*

**Arithmetic Logic Unit (ALU)**

ALU contains the electronic circuitry that executes all arithmetic and logical operations on the available data. ALU uses **registers** to hold the data that is being processed.

*Most ALUs can perform the following operations*

(i) Logical operations (AND, NOT, OR, XOR).

(ii) Arithmetic operations (addition, subtraction, multiplication and division).

(iii) Bit-shifting operations (shifting or rotating a word by a specified number of bit to the left or right with or without sign extension).

(iv) Comparison operations (=, <, < = >, >, > =)

**Control Unit (CU)**

CU coordinates with the input and output devices of a computer. It directs the computer to carry out stored program instructions by communicating with the ALU and the registers. It organises the processing of data and instructions.

The basic function of control unit is to fetch the instruction stored in the main memory, identify the operations and devices involved in it and accordingly generate control signals.

**Memory Unit**

This unit is responsible to store programs or data on a temporary or permanent basis. It has primary memory (main memory) and secondary memory (auxiliary memory).

The input data which is to be processed is brought into main memory before processing.

Another kind of memory is referred to as secondary memory of a computer system. This unit is used to permanently store data, programs and output. This unit does not deal directly with the CPU.



## Multiple Choice Questions ▼

**1. The portion of the CPU that coordinates the activities of all the other computer components is the**

(a) motherboard (b) coordination board

(c) control unit (d) arithmetic logic unit.

**2. Which among the following is an important circuitry in a computer system that directs the operation of the processor?**

(a) Memory (b) Address Bus

(c) Accumulator (d) Control unit.

**3. The part of a computer that coordinates all its functions, is called**

(a) ROM program (b) System board

(c) Arithmetic logic unit (d) Control unit.

**4. The CPU comprises of control, memory and ..... units.**

(a) microprocessor (b) arithmetic/logic

(c) output (d) ROM.

**5. What is the responsibility of the logical unit in the CPU of a computer?**

(a) To produce result (b) To compare numbers

(c) To control flow of information (d) To do maths work.

**6. Which unit of computer helps in communication between the memory and the arithmetic logical unit?**

(a) CMU (b) CCU

(c) UPS (d) CPU.

**7. Information that comes from external source and fed into computer software is called**

(a) output (b) input

(c) throughout (d) reports.

**8. Input unit converts data in computer in ..... form.**

(a) suitable (b) acceptable

(c) understandable (d) rejectable.

**9. This unit sends the processed results to the user.**

(a) input (b) output

(c) memory (d) CPU.

**10. CPU retrieves its data and instructions from**

(a) secondary memory (b) auxiliary memory

(c) main memory (d) all of these.

**11. Which computer memory is used for storing programs and data currently being processed by the CPU?**

(a) Mass memory (b) Internal memory

(c) Non-volatile memory (d) PROM.

12. The I/O processor has a direct access to ..... and contains a number of independent data channels.
(a) main memory (b) secondary memory
(c) cache (d) flash memory.

13. How many types of arithmetic operations does the ALU of computer perform?
(a) 4 (b) 2
(c) 5 (d) 3.

14. Processors contain a control unit and a/an
(a) control unit (b) primary storage unit
(c) input unit (d) arithmetic logic unit.

15. Which of the following executes the computer commands?
(a) Arithmetic unit (b) Logic unit
(c) Both (a) and (b) (d) Control unit.

16. The main job of a CPU is to
(a) carry out program instructions
(b) store data/information for further use
(c) process data and information
(d) Both (a) and (c).

17. The main purpose of time-sharing techniques used in computers is to make the best use of the
(a) CPU (b) peripherals
(c) secondary storage (d) floppy discs.

18. The CPU is made up of two smaller components.
(a) ALU and CU (b) ALU and RAM
(c) RAM and ROM (d) RAM and CU.

19. Which of the following is metal or plastic case that holds all the physical parts of the computer?
(a) System unit (b) CPU
(c) Mainframe (d) Platform.

20. The components that process data are located in which of the following?
(a) Input devices (b) Output devices
(c) System unit (d) Storage component.

21. Which of the following is not responsible for the performance of the computer?
(a) Number of keys in the keyboard
(b) Format of the video/graphics word
(c) Memory in the video/graphics word
(d) The clock speed of the processor.

22. The word 'computer' usually refers to the central processing unit plus:
(a) external memory (b) internal memory
(c) input devices (d) output devices.

23. Which unit is a combinational digital electronic circuit that performs arithmetic and bitwise operations on integer binary numbers?
(a) BOU (b) AEU
(c) CPU (d) ALU.



24. Internal memory in a CPU is nothing but
(a) a set of registers (b) a set of ALU
(c) microprocessor (d) bus.

25. Which among the following is a small set of data holding place that is a part of the computer processor and may hold an instruction, a storage address or any kind of data?
(a) Register (b) WAN
(c) Bus (d) Address.

26. Which instruction is used for loading data into CPU accumulator register from memory?
(a) Load (b) Storage
(c) Machine (d) Access.

27. Where does computer add and compare data?
(a) Hard disc (b) Floppy disc
(c) CPU (d) Memory chip.

28. In computer, which of the following unit is responsible for processing and also known as brain of computer?
(a) CPU (b) Keyboard
(c) Hard disk (d) RAM.

29. A(n)..... device is any device that provides information, which is sent to the CPU.
(a) input (b) output
(c) CPU (d) memory.

30. Which of the following includes as a type of input?
(a) Data (b) Programs
(c) Commands (d) All of these.

31. The control unit controls other units by generating
(a) control signal (b) timing signal
(c) transfer signal (d) command signal.

32. Control unit of a digital computer is often called the
(a) clock (b) nerve centre
(c) Both (1) and (2) (d) IC.

33. Memory unit the communicates directly with the CPU is called the
(a) main memory (b) secondary memory
(c) auxiliary memory (d) register.

## Answers

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (c) | 2. | (d) | 3. | (d) | 4. | (b) | 5. | (b) | 6. | (d) | 7. | (b) | 8. | (b) |
| 9. | (b) | 10. | (c) | 11. | (b) | 12. | (a) | 13. | (a) | 14. | (d) | 15. | (c) | 16. | (d) |
| 17. | (a) | 18. | (a) | 19. | (a) | 20. | (c) | 21. | (a) | 22. | (a) | 23. | (d) | 24. | (a) |
| 25. | (a) | 26. | (a) | 27. | (c) | 28. | (a) | 29. | (a) | 30. | (d) | 31. | (a) | 32. | (b) |
| 33. | (a). | | | | | | | | | | | | | | |

## 3. Computer Memory

### Computer Memory

The memory or storage unit of a computer is made up of such means, which are used to store information at the time of execution of a program. This part is also used to store the interim and final results of a program for some time during its execution. The memory is designed in such a way that it is possible for the control unit to get any information from it. The part of the memory that is in direct contact with the CPU is called the internal (main) memory and the device which performs the function of backup storage, is called the external (auxiliary) memory.

### Types of Computer Memory

Computer uses different types of memory:

**1. Primary memory:** Primary memory is also called main memory or internal memory. This part of the computer stores data and program instructions for execution.

There are two types of primary memory: (i) RAM, (ii) ROM

**(i) RAM (Random Access Memory):** It is called Random Access Memory because through it the computer can store data in any order and can also retrieve it. It takes the same amount of time to read data from any location in RAM.

There are following types of RAM:

(a) Static RAM or SRAM

(b) Dynamic RAM or DRAM

**(ii) ROM (Read Only Memory):** It is called 'read only memory' because the instructions written on it can only be read, written or erased or modified. This is a permanent memory, that is, the data stored on it is not lost even after the power supply is turned off and can be retrieved. It is used to store the information of the BIOS [Basic Input Output System (BIOS)]. The program written on it is also called 'firmware', which gets executed as soon as the computer is switched on. In this, the operating system is transferred to the RAM at the time of booting by the store program itself.

**2. Cache memory:** It falls under the category of primary memory, but sometimes it is also considered as 'tertiary memory'. The cache memory is used between the primary memory and the CPU. CPU speed is very high, compared to primary memory speed is very low, so to reduce the speed difference between these two, cache is put between these two. The speed of the hair is less than the CPU, but more than the primary memory. By using this, the speed of our CPU working per second increases.

Cache memory resides as a buffer between the processor and the standard modules. The latest instruction and its data are kept in the cache memory. When the processor needs some information, it first looks at the cache memory, then the main memory is looked at.

**3. Secondary Memory:** The primary memory used in the computer cannot store all the data of the computer, so secondary memory is used to store a lot of data. It is also called auxiliary or external memory.

Secondary memory is available in the form of various devices. Secondary memory can also be called secondary storage device.



**Types of Secondary Memory:** On the basis of whether the secondary memory is a part of the CPU or not, it is of two types:

(i) Fixed storage device (ii) Removable storage device

### Magnetic Storage Equipment

Currently, magnetic storage is usually installed on hybrid Hard Drives (HD) or very large Hard Disk Drives (HDD).

A list of magnetic storage devices is given below:

### (A) Magnetic Disk

Magnetic disk is a useful and specialized storage device, because in this, data can be obtained and stored at a faster rate than with direct access method. There are two main types of magnetic disks—hard disks and diskettes.

**Hard disk:** Hard disk consists of circular, solid platters or disks. They have more storage capacity and the speed of receiving data is also faster. Hard disk is used in all three microcomputers, mini computers and mainframe computers. There are many types of hard disks available nowadays. Main diskettes are floppy, Zip disc, Magnetic disc etc.

### (B) Optical Disc

The most popular alternative to magnetic storage medium is optical disc. In this type of disc, data is read or written with the help of laser beam. CD ROM is the most popular device in this type of disc. Its biggest feature is that it has the ability to store a large amount of data and it can be easily sent from one place to another. To operate it requires a drive which we know as CD drive or DVD drive.

**1. CD (Compact Disc):** It is round disc in structure. Data is written on it by laser rays. The CD was first introduced by Philips and Sony. It consists of a thin round shape (120 mm) and a layer of silver and aluminium, on which is a thin layer of polycarbonate plastic. There are two types of CDs:

(i) Read Only CD, (ii) Read/Write CD

**2. DVD (Digital Video Disc):** Another sophisticated form of CD is also used which is called DVD. Their storage capacity can be 2GB or more. There is a special drive for writing or reading data on it, which is called DVD drive. Also known as Digital Versatile Disc or Digital Video Disc, is an optical disc storage media format and was developed by Sony, Panasonic and Samsung in 1995.

**3. Blu-ray disc:** Blu-ray, it is an optical disc storage medium designed to replace the standard DVD format. Blu-ray Disc takes its name from the Blue-Violet laser used to read it. A standard DVD uses a 650 nano-meter red laser, while Blu-ray Disc uses a shorter wavelength, a 400 nano-meter blue-violet laser and allows for about ten times more data storage than a DVD.

### Flash Memory Devices

Flash memory is cheap as well as portable. Most magnetic and optical media have been replaced with flash memory devices, becoming a more reliable and efficient solution.

**Flash drive / Pen drive:** It is a type of storage device available in the shape of a pen. Which can store about 5/2 data. The biggest advantage of this device is that due to its small size, it can be easily carried from one place to another and it only has to be attached to the USB port for use with the computer.

**Memory cards:** Memory cards are commonly used in digital cameras, printers, MP3 players, PDAs, digital camcorders, game consoles and handheld computers. The most common memory card format for many years was Compact flash, but currently there are CF Express, SD, Micro SD and XQD.

**Compact flash:** Compact flash is a type of flash memory commonly found in digital cameras, PDAs, and other portable devices. It is a 50-pin connection storage device capable of storing data from 2 MB to 128 GB.

M.2 - M.2 is a solid-state drive, which was introduced in 2014. There are two types of M.2 devices and they are SATA M.2 and PCIe M.2.

**Multimedia card:** A multimedia card or MMC is an integrated circuit used in car radios, printers, PDAs, MP3 players and digital cameras. It acts as an external storage for the data. MMCP (MMC Plus) and MMCM (MMC Mobile/MMC Micro) are variations of the MMC card.

**SSD:** This is a storage medium similar to a hard disk drive. Even without power, it has the ability to maintain the stored data in a permanent state.

**SD card:** An SD card stands for Secure Digital Card, it is commonly used with electronics which is designed to provide high capacity memory with small size. It is often used on small portable devices such as in cell phones, digital cameras, digital video camcorders, MP3 players etc. It is used by over 400 brands of electronic equipments.

## Online Cloud Storage

The need to store data in online cloud storage is increasing rapidly.

**Cloud storage:** Cloud storage is a cloud computing model that transmits as well as stores data over a remote storage system, where a cloud computing provider provides the management and maintenance of data to users over a network. It provides users with reliability, privacy, stability and data access at any time.

**Network media:** Network media is used on computer networks such as the Internet, as it can be any audio, video, picture or text.

**Basic Units of Memory Measurements**

| | | |
|---|---|---|
| 1 Bit | = | Binary Digit (0 or 1) |
| 4 Bits | = | 1 Nibble |
| 8 Bits | = | 1 Byte = 2 Nibble |
| 1024 Bytes | = | 1 KB (KiloByte) |
| 1024 KB | = | 1 MB (MegaByte) |
| 1024 MB | = | 1 GB (GigaByte) |
| 1024 GB | = | 1 TB (TeraByte) |
| 1024 TB | = | 1 PB (PetaByte) |
| 1024 PB | = | 1 EB (ExaByte) |
| 1024 EB | = | 1 Zb (ZettaByte) |
| 1024 ZB | = | 1 YB (YottaByte) |
| 1024 YB | = | 1 (BrontoByte) |
| 1024 BB | = | 1 (GeopByte) |



## Multiple Choice Questions ▼

1. **Which of the following is not true about RAM?**
   (a) RAM is the same as hard disk storage (b) RAM is a temporary storage area
   (c) RAM is volatile (d) RAM is a primary memory.
2. **Virtual memory allocates hard disk space to supplement the immediate, functional memory capacity of**
   (a) ROM (b) EPROM (c) the registers (d) RAM.
3. **Which of the following is a correct definition of volatile memory?**
   (a) It does retain its contents at high temperature
   (b) It is to be kept in air-tight box
   (c) It loses its content on failure of power supply
   (d) It does not lose its content on failure of power supply.
4. **Cache and main memory will not be able to hold their contents when the power is OFF. They are**
   (a) dynamic (b) static (c) volatile (d) non-volatile.
5. **In computer terminology, what is the full form of RAM?**
   (a) Random Access Memory (b) Repeated Access Memory
   (c) Rapid Access Memory (d) Regular Access Memory.
6. **The secondary storage devices can only store data but they cannot perform**
   (a) arithmetic operations (b) logic operations
   (c) fetch operations (d) all of these.
7. **Where do you save the data that, your data will remain intact even when the computer is turned OFF?**
   (a) RAM (b) Motherboard
   (c) Secondary storage device (d) Primary storage device.
8. **The storage device used to compensate for the difference in rates of flow of data from one device to another is termed as**
   (a) chip (b) channel (c) floppy (d) buffer.
9. **Which of the following is the magnetic storage device?**
   (a) Hard disk (b) Compact disc
   (c) Audio tapes (d) all of these.
10. **Compact discs that can store approximately 650-800 MB of data or 74-80 min of music are**
    (a) zip discs (b) CD-ROM
    (c) video cards (d) pressing machines.
11. **A flat metallic disk that contains a large amount of permanently stored information read optically is called a**
    (a) monitor (b) ALU (c) CD-ROM (d) RAM.
12. **CD-ROM is an example of**
    (a) input device (b) output device
    (c) both input and output devices (d) memory device.
13. **DVD refers to**
    (a) digital video developer (b) digital video device
    (c) digital video disc (d) none of these.

**14. Which of the following is correct sequence of smallest to largest units of storage size?**
(a) Petabyte, Kilobyte, Megabyte, Gigabyte, Terabyte
(b) Kilobyte, Megabyte, Terabyte, Petabyte, Gigabyte
(c) Megabyte, Terabyte, Gigabyte, Kilobyte, Petabyte
(d) Kilobyte, Megabyte, Gigabyte, Terabyte, Petabyte.

**15. How many gigabytes is eqyal to 1 petabyte?**
(a) 256 (b) 512 (c) 1024 (d) 1024 × 1024

**16. Why RAM is a so called?**
(a) Because it is read and write memory
(b) Because it is a volatile memory
(c) Because it can be selected directly for storing and retrieving data and instructions of any location of chip
(d) Because it is a non-volatile memory.

**17. Storage that retains its data after the power is turned OFF is referred to as**
(a) volatile storage (b) non-volatile storage
(c) sequential storage (d) direct storage.

**18. The advantage of DRAM is**
(a) it is cheaper than SRAM
(b) it can store data more than that of SRAM
(c) it is faster than SRAM
(d) data can be erased easily from it as compared to SRAM.

**19. Which of the following stores data permanently in a computer?**
(a) ALU (b) Cache memory
(c) RAM (d) ROM.

**20. Which of the following is a very high speed semiconductor memory which can speed up the CPU?**
(a) Secondary memory (b) Main memory
(c) Primary memory (d) Cache memory.

**21. What is the term used for temporarily stored data?**
(a) Miscellaneous data (b) Cache data
(c) Picked data (d) Tempo data.

**22. The thick, rigid metal plotters that are capable of retrieving information at a high rate of speed are known as**
(a) hard disk (b) SAN
(c) soft disk (d) flash memory.

**23. Data on a floppy disk was recorded in rings called**
(a) flip (b) ringers (c) rounders (d) segments.

**24. Magnetic tape is not practical for applications where data must be quickly recalled because tape is**
(a) a random access medium (b) a sequential access medium
(c) a read only medium (d) fragile and easily damaged.



**25. Which of the following can hold maximum data?**
(a) optical disc (b) Floppy disk
(c) Magnetic disk (d) Magnetick tape.

**26. A DVD is an example of a(n)**
(a) optical device (b) output device
(c) hard disk (d) solid state storage device.

**27. Which of the following discs can be read only?**
(a) DVD-R (b) DVD-ROM
(c) DVR-RW (d) CD-R.

**28. Which is not an external storage device?**
(a) CD-ROM (b) DVD-ROM
(c) Pen drive (d) RAM.

**29. What does the computer abbreviation 'MB' used for?**
(a) Megabit (b) Millionbytes
(c) Megabytes (d) Millionbit.

**30. The amount of memory (RAM or ROM) is measure in**
(a) bytes (b) bits
(c) megabytes (d) megabits.

**31. How many kilobytes make a megabyte?**
(a) 128 (b) 1024
(c) 256 (d) 512.

**32. The key feature(s) of internal memory is/are**
(a) limited storage capacity (b) temporary storage
(c) fast access and high cost (d) all of these.

**33. The two kinds of main memory are**
(a) ROM and RAM (b) primary and secondary
(c) floppy disk and hard disk (d) direct and sequential.

**34. Permanent instructions that the computer use when it is turned ON and that cannot be changed by other instructions are contained in**
(a) ROM (b) RAM
(c) ALU (d) SRAM.

**35. When you first turn on a computer, the CPU is preset to execute instructions stored in the**
(a) RAM (b) flash memory
(c) ROM (d) CD-ROM.

**36. What is the full form of PROM?**
(a) Programmable Read Ony Memory (b) Program Read Output Memory
(c) Program Read Only Memory (d) Primary Read Only Memory.

**37. Data on a floppy disk is recorded in rings called**
(a) sectors (b) ringers
(c) rounders (d) tracks.

**38. Which of the following is/are example(s) of magnetic storage media?**
(a) Zip disk (b) CD-ROM
(c) Floppy disk (d) Both (a) and (c).

**39. Floppy disks are organised as**
(a) files (b) head and folders
(c) tracks and sectors (d) all of these.

**40. The capacity of 3.5 inch floppy disk is**
(a) 1.40 MB (b) 1.44 GB
(c) 1.40 GB (d) 1.44 MB.

**41. The most common storage device for the personal computer is the**
(a) floppy disk (b) USB personal computer
(c) mainframe (d) a laptop.

**42. Which of the following has the smallest storage capacity?**
(a) Zip disk (b) Hard disk
(c) Floppy disk (d) Data cartridge.

**43. Which media has the ability to have data/information stored (written) on them by users more than once?**
(a) CD-R discs (b) CD-RW discs
(c) Zip discs (d) Optical discs.

**44. What is the difference between a CD-ROM and CD-RW?**
(a) They are the same-just two different terms used by different manufactures
(b) A CD-ROM can be written to and a CD-RW cannot
(c) Other than those given as options
(d) A CD-RW can be written to but a CD-ROM can only be read from.

**45. Which of the following is the smallest measure of storage?**
(a) Tera byte (b) Gigabyte (c) Kilobyte (d) Byte.

**46. The term 'gigabyte' refers to**
(a) 1024 byte (b) 1024 kilobyte
(c) 1024 megabyte (d) 1024 gigabyte.

**47. Where is data saved permanently?**
(a) Memory (b) Storage
(c) CPU (d) Printer.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (a) | **2.** | (d) | **3.** | (c) | **4.** | (c) | **5.** | (a) | **6.** | (d) | **7.** | (c) | **8.** | (d) |
| **9.** | (a) | **10.** | (b) | **11.** | (c) | **12.** | (d) | **13.** | (c) | **14.** | (d) | **15.** | (d) | **16.** | (b) |
| **17.** | (b) | **18.** | (a) | **19.** | (d) | **20.** | (d) | **21.** | (b) | **22.** | (a) | **23.** | (d) | **24.** | (b) |
| **25.** | (d) | **26.** | (a) | **27.** | (b) | **28.** | (d) | **29.** | (c) | **30.** | (c) | **31.** | (b) | **32.** | (d) |
| **33.** | (a) | **34.** | (a) | **35.** | (c) | **36.** | (a) | **37.** | (d) | **38.** | (d) | **39.** | (c) | **40.** | (d) |
| **41.** | (a) | **42.** | (c) | **43.** | (b) | **44.** | (d) | **45.** | (d) | **46.** | (c) | **47.** | (b). | | |

**II. Application software**

Application software is a set of one or more programs that are designed for specific uses or applications and which enable the user to interact with a computer. They are used with system software only. These include different types of programs, which are either made by the user or are available in the market as readymade.

Application software can be mainly divided into two categories:

**1. General Purpose Software:** General purpose software is designed keeping in mind the everyday needs of the consumer. These programs instruct the computer to perform simple tasks. Some of these are as follows:

(i) Word Processing Software
(ii) Database Management Software
(iii) Desktop Publishing Software

**2. Specific Purpose Software:** Specific purpose software is designed to perform specific tasks. These are specially designed keeping in mind the requirements of the consumer. These software are often written in high level language, which the software designer uses. Some of the specific purpose software are as follows:

(i) Billing Software
(ii) Hotel Management Software
(iii) Payroll Management Software

**III. Utility Software**

These are special types of programs, which are designed to repair or maintain the computer or the components connected to the computer. Using them, the computer can be operated easily and well. These software are not necessarily necessary for the computer, that is, the computer can be run without them. Following are the examples of these:

(1) Disk Defragmenter
(2) Virus Scanner and Remover
(3) Text Editing
(4) Debugging Tool

## Multiple Choice Questions ▼

1. **This type of software works with end-users, application software and computer hardware to handle the majority of technical details:**
   (a) communication software
   (b) application software
   (c) utility software
   (d) system software.
2. **It is a set of programs that enables your computer's hardware device and application software to work together :**
   (a) management
   (b) processing
   (c) utility
   (d) system software.

14. ..... is a software which is used to do particular task.
(a) Operating system (b) Program
(c) Data software (d) Application software.

15. The ..... manual tells you how to use a software program.
(a) documentation (b) programming (c) user (d) technical.

16. Software designed for a specific purpose/application such as pay calculations, processing of examination result etc. are known as
(a) utility software (b) system software
(c) application software (d) customised software.

17. Application software
(a) is used to control the operating system
(b) is designed to help programmers
(c) performs specific task for computer users
(d) is used for making design only.

18. The software that is used to create text-based documents re referred to as .....
(a) DBMS (b) suites
(c) spreadsheets (d) word processors.

19. Which of the following is not related to an application software?
(a) Word processor (b) DBMS
(c) Operating system (d) Railway reservation system.

20. ..... disk encryption is a technology (hardware or software) where data is encrypted before storage.
(a) Half (b) Whole (c) Double (d) Triple.

21. The two broad categories of software are
(a) word processing and spreadsheet (b) transaction and application
(c) windows and Mac OS (d) system and application.

22. System software
(a) allows the user to diagnose and troubleshoot the device
(b) is a programming language
(c) is a part of productivity suite
(d) helps the computer manage internal resources.

23. A collection of various programs that helps to control your computer is called
(a) system software (b) application software
(c) microsoft excel (d) microsoft word.

24. ..... helps in converting programming language to machine language.
(a) Operating system (b) Device drive
(c) Language translator (d) Linker.

25. A linker program
(a) places the program in the memory for the purpose of execution
(b) relocates the program to execute from the specific memory area allocatged to it
(c) links the program with other programs needed for its execution
(d) interfaces the program with the entities generating its input data.

# 5. MS-Word

MS Word 2000 is an application program that allows you to create letters, reports, newsletters, tables, form letters, brochures and web pages. Using word you can add pictures, tables and charts to your documents. You can also check spelling and grammar.

## Main Features of MS Word

(1) You can create documents fast, using build-in and custom templates.

(2) You can easily manage large documents using various features, like the ability to create table of contents, index and cross references.

(3) With the help of mail merge, you can quickly create merge documents like mass mailings or mailing labels.

(4) You can easily create and format tables using the features like AutoFormat.

(5) AutoCorrect and AutoFormat features rectify typographical errors automatically and allow you to use predefined shortcuts and typing patterns to quickly format your documents.

(6) The print zoom facility scales a document on different paper sizes and allows you to print out multiple pages on a single sheet of paper.

(7) The nested tables feature supports putting one table inside another table.

(8) The picture bullets make it easy to insert tiny pictures before each item in a list.

(9) Collect and paste lets you copy more than one item to the clipboard at a time. You can collect information from many sources and paste it into one place.

(10) By putting your word documents on the Web server, you can share your information with other people.

(11) The multilingual features of Word allows to type different languages in the same document.

## Managing Documents

This section of the lesson explains how to open a new/existing document, save a document, renaming a document, working with multiple documents, protecting a document, finding a document and closing a opened document. There are several ways to create a new document, open existing documents and save documents in Word.

**Create a New Document:** To create a new document , follow any one of the following methods:

(1) Click the New document button on the menu bar.

(2) Choose File → New command from the menu bar.

(3) Press Ctrl + N keys on the keyboard.

**Open an Existing Document:** To open an existing document, follow any one of the following methods:

(1) Click the Open File button on the menu bar.

(2) Choose File → Open command from the menu bar.

(3) Press Ctrl + O keys on the keyboard.



Each of the above method will show the Open dialog box. Choose the file and click the open button.

**Save a New/Existing Document:** To save a new/existing document that is opened, follow any one of the following methods:

(1) Click the Save button on the menu bar.

(2) Select File → Save commands on the menu bar from the menu bar.

(3) Press Ctrl + S keys on the keyboard.

If the document is already named and saved earlier, it will simply save the document,

**Working on Multiple Documents:** Several documents can be opened simultaneously if you are typing or editing multiple documents at once. All open documents are listed under the Window menu as shown below. The current document has a check-mark beside the file name. Select another name to view another open document or click the button on the Windows taskbar at the bottom of the screen.

**Protecting a Document:** You can protect your document from being accidentally changed its format an text or from other users to get access to it.

## Protecting a Document from Accessing

If you want to protect a document from other users accessing to it, give a password to your file. Follow the steps given below:

(1) When the file is open, select File → Save As command on the menu bar. Then Save As dialog box appears. Move the cursor on the Tools tab on the top right side of Save As dialog box and click. A submenu will appear.

(2) Click on General Options. The Save dialog box opens. You will see two boxes: Password to open and Password to modify.

(3) Type a password in Password to open box. (A password can be up to 15 character case-sensitive letters, numerals, spaces and symbols. As you type the password, Word displays an asterisk (*) for each character you type.)

(4) Click OK. The Confirm Password dialog box appears. Retype the password you typed earlier. Click OK on Confirm Password dialog box and then click OK on Save dialog box and then click OK on Save As dialog box.

(5) When you open the file next time it will ask you to type the password.

**Printing Documents:** While printing a document you have the following options in Print dialog box:

(1) Name of the printer (if you have more than one printers).

(2) Choose paper size, orientations, resolution etc. by pressing Properties button.

(3) Print the entire document or only current page or specific pages.

(4) Print draft copy, which omits graphics to allow faster printing.

(5) Number of copies to be printed etc.

**Printing a Document:** To print a document or selected pages follow the steps given below:

(1) Open the document to be printed.

(2) Choose File → Print command on the menu bar. The Print dialog box will open. Select the Options like print range, Number of copies, Printer name etc. See that printer is switched on and the paper is available in the printer tray.

(3) Click OK.

**Printing a Document on a Different Paper Size:** You might have created a document using some selected paper size. You may want to print that document in a different paper size or multiple pages in a single sheet of paper without disturbing the general format. You can do it using Zoom feature in Print dialog box. Follow the steps given below to resize your document to fit into a new paper size.

**Printing a Document's Multiple Pages in a Single Sheet of Paper:** If you want to print multiple pages of a document in a single sheet of paper, follow the steps given below:

(1) Open the document to be printed.

(2) Choose File → print command on the menu bar. The Print dialog box will open. Select the Options like print range, Number of copies, Printer name etc. See that printer is switched on and the paper is available in the printer tray.

(3) Select the appropriate paper size in pages per sheet: Under Zoom in Print dialog box.

(4) Click OK.

**Print Preview:** Print preview provides a way to see how your document will look when printed.

You can see several pages at once. It is similar to Print Layout View. An advantage of Print preview is that it has its own toolbar. The toolbar allows you to easily view multiple pages and change the magnification of the screen. You can also edit your document in print preview mode.

To switch to print preview, use one of these methods:

(1) Click on the Print preview button on the Standard toolbar.

(2) Press Ctrl + F2 keys.

## Exit Word Program

When finished you can close all the files, and quite the Word program by selecting File → Exit command on the menu bar.

| Action | | Text Style | |
|---|---|---|---|
| **Document** | | | |
| Open a file | Ctrl + O | Font face | Ctrl + Shift +F |
| New file | Ctrl + N | Font size | Ctrl + Shift + P |
| Close a file | Ctrl + W | Bold | Ctrl + B |
| Save As | F12 | Italics | Ctrl + I |
| Save | Ctrl+S or Shfit + F12 | Underline | Ctrl + U |
| Print Preview | Ctrl + F2 | Double underline | Ctrl + Shift + D |
| Print | Ctrl + P | Word underline | Ctrl + Shift + W |
| Show/Hide paragraph symbols | Ctrl + * | All caps | Ctrl + Shift + A |
| Spelling and grammar | F7 | Change case | Shift + F3 |



| | | | |
|---|---|---|---|
| Help | F1 | Subscript | Ctrl + = |
| Find | Ctrl + F | Superscript | Ctrl + Shift + = |
| Replace | Ctrl + H | Make web hyperlink | Ctrl + K |
| Go To | Ctrl +G | | |

| Cursor movement | | Tables | |
|---|---|---|---|
| Select all - entire document | Ctrl + A | Go to next cell | Tab |
| Select from cursor to beginning of line | Shift + Home | Go to previous cell | Shift + Tab |
| Select from cursor to end of line | Shift + End | Go to beginning of column | Alt + PageUp |
| Go to beginning of line | Home | Highlight to beginning of column | Alt + Shift + PageUp |
| Go to end of line | End | Go to end of column | Alt + PageDown |
| Go to beginning of document | Ctrl + Home | Highlight to end of column | Alt + Shift + PageDown |
| Go to end of document | Ctrl + End | Go to beginning of row | Alt + Home |
| | | Highlight to beginning of row | Alt + Shift + Home |
| | | Go to end of row | Alt + End |
| | | Highlight to end of row | Alt + Shift + End |
| | | Column break | Ctrl + Shift + Enter |

| Format | | Miscellaneous | |
|---|---|---|---|
| Cut | Ctrl + V | Copyright © | Alt + Ctrl + C |
| Copy | Ctrl + C | Date field | Alt + Shift + D |
| Paste | Ctrl + P | Go to footnotes | Alt + Ctrl + F |
| Undo | Ctrl + Z | Show/Hide ¶ | Ctrl + Shift + 8 |
| Redo | Ctrl + Y | Thesaurus | Shift + F7 |
| Format painter | Ctrl + Shift + C | | |
| Left alignment | Ctrl + L | | |
| Center alignment | Ctrl + E | | |

| | |
|---|---|
| Right alignment | Ctrl + R |
| Justified | Ctrl + J |
| Delete previous word | Ctrl + Backspace |
| Apply bulleted list | Ctrl + Shift + L |
| Indent | Ctrl + M |
| Page break | Ctrl + Enter |

## Multiple Choice Questions ▼

**1. Which command is used to store the active document permanently?**
(a) Save (b) Send
(c) Prepare (d) Save As.

**2. Which shortcut key is used to high light the entire word document?**
(a) Ctrl + A (b) Ctrl + O
(c) Ctrl + S (d) Ctrl + E.

**3. The print resolution (quality) and colour preferences may be set using _____ option available in print dialog.**
(a) Collate
(b) Scale
(c) Printer properties → Finishing → Print on both sides
(d) Properties → Paper/Quality.

**4. What is the purpose of quick access toolbar?**
(a) To hold advance function
(b) To hold special function
(c) To hold basic function
(d) To hold familiar and repeated function.

**5. Which bar contains the current position of the cursor in MS Word?**
(a) Layout (b) Title bar
(c) Status bar (d) Horizontal ruler.

**6. Where does the close button appear in MS Word?**
(a) Top left corner of the window
(b) Bottom left corner of the window
(c) Top right corner of the window
(d) Bottom right corner of the window.

**7. Which one of the following is text styling feature of MS Word?**
(a) Word fill (b) Word art
(c) Word colour (d) Word font.

**8. Which option is used to view an exiting word document?**
(a) New (b) Open
(c) Publish (d) Prepare.



**9. Which document view given an appearance as in web browser?**
(a) Draft view (b) Outline view
(c) Web layout view (d) Full screen reading.

**10. How many groups are there in Home Menu?**
(a) 4 (b) 5
(c) 6 (d) 7

**11. Which group includes superscript, subscript, strike through options in MS Word?**
(a) Clipboard (b) Font
(c) Paragraph (d) Style.

**12. What is the purpose of ☒ button?**
(a) Close button (b) Office button
(c) Maximize buttons (d) Minimize button.

**13. What is the purpose of zoom option?**
(a) Enlarge and reduce document / text size
(b) Move up and down document / picture
(c) Scroll left and light document / picture
(d) Minimize and maximize the document / picture.

**14. Which option is used for tab setting?**
(a) Horizontal ruler (b) Status bar
(c) Vertical ruler (d) Vertical scroll bar.

**15. What is the purpose of vertical scroll bar?**
(a) Move the document up and down
(b) Move the document left side
(c) Move the document right side
(d) Move the document only upwards.

**16. What is the purpose of undo action in MS Word?**
(a) Restore previous action (b) Get the current action
(c) Goes to previous page (d) Goes to previous paragraph.

**17. Which option is used to activate and deactivate ruler?**
(a) View → grids (b) View → ruler
(c) Insert → tool bar (d) Insert → ruler.

**18. What is the purpose of cover page?**
(a) Allows to fill title, author, date and other information
(b) Fills the list of people intent to mail
(c) To view the mailed list
(d) Contains details of the documents.

**19. Which menu contains, Symbol option in MS Word?**
(a) Tools (b) Table
(c) Format (d) Insert.

**20. Which option is used to locate any specific character, symbols or formulas in a document?**
(a) Find (b) Searching text
(c) Replace (d) Selecting text.

**21. Which feature is used to create a newspaper type document?**
(a) Tables (b) Tab stops
(c) Columns (d) Bullets and numbering.

**22. Which sequence of operation is required to insert bullets for list of data?**
(a) Paragraph group → numbering button → select any number type
(b) Paragraph group → number button → select none.
(c) Paragraph group → bullet button → type of bullets
(d) Paragraph group → bullet button → select none.

**23. Which sequence of operation is required to remove numbering from a list of data?**
(a) Number button → select none from number type
(b) Number button → select number from number list
(c) Bullet button → select none from bullet type
(d) Bullet button → select bullets from bullets list.

**24. Which sequence of operation is required to remove tab stop markers from ruler?**
(a) Drag the tab stop makers out of the ruler
(b) Double click the tab marker and clear all
(c) Right click the tab stop marker and choose remove
(d) Left click the tab stop marker and choose remove.

**25. Which feature is used to adjust the amount of space between words for alignment in MS Word?**
(a) Spacing (b) Scaling
(c) Justifying (d) Positioning.

**26. How can we rectify the errors occurs while typing?**
(a) AutoEntry (b) AutoAdd
(c) AutoSpell (d) AutoCorrect.

**27. Which sequence of operation is required to force page break in word document?**
(a) By using insert / selection black on the insert tab
(b) By positioning the cursor at the appropriate place and press enter
(c) By positioning the cursor at the appropriate place and press F1 key
(d) by position the cursor at the appropriate place and pressing Ctrl + enter.

**28. What is the purpose of inserting header and footer in document?**
(a) To make the starting and ending page
(b) To entrance the appearance of the document
(c) To make larger document more readable
(d) To allow page headers and footer appear on the document.



**29. What is purpose of thesaurus tool is MS Word?**
(a) Grammar option (b) Spelling suggestion
(b) Synonyms and antonyms words (d) AutoCorrection.

**30. MS word is a ..... software.**
(a) Word Processing (b) Word editor
(c) Text editor (d) Typing.

**31. Extension name of Word 2004 ..... .**
(a) .doc (b) .docx
(c) .txt (d) .jpg.

**32. In MS Word, Ctrl + S is for ..... .**
(a) scenarios (b) size
(c) save (d) spelling check.

**33. Which key is used to increase left indent?**
(a) Ctrl + I (b) Ctrl + M
(c) Ctrl + F (d) Ctrl + N.

**34. Which key is used to select all the text in the document?**
(a) Ctrl + A (b) Ctrl + M
(c) Ctrl + F (d) Ctrl + N.

**35. To undo the last work, press ..... .**
(a) Ctrl + A (b) Ctrl + Z
(c) Ctrl + F (d) Ctrl + N.

**36. What is the purpose of gutter margin?**
(a) Margin that is added to the left margin when printing
(b) Margin that is added to the right margin when printing
(c) Margin that is added to binding side of page when printing
(d) Margin that is added to the outside of the page when printing.

**37. Portrait and Landscape are:**
(a) page orientation (b) paper size
(c) page layout (d) all of these.

**38. If you need to change the typeface of document, which menu will you choose?**
(a) Edit (b) View
(c) Format (d) Tools.

**39. What is the portion of a document in which you set certain page formatting options?**
(a) Page (b) Document
(c) Section (d) Page setup.

**40. Boarders can be applied to**
(a) cells (b) paragraph
(c) text (d) all of these.

**41. Which of these toolbars allows changing of fonts and their sizes?**
(a) Standard (b) Formatting
(c) Print preview (d) None of these.

**42. Microsoft word can be started via**
(a) start menu (b) desktop
(c) (a) and (b) (d) none of these.

**43. Which option are used for opening, saving, important files?**
(a) Print (b) File
(c) Tool (d) none of these.

**44. What is the shortcut for printing?**
(a) Alt + P (b) Space + P
(c) Ctrl + P (d) Ctrl + Z.

**45. What is the shortcut for saving a document?**
(a) Alt + P (b) Space + P
(c) Ctrl + P (d) Ctrl + S.

**46. In order to create an new file from an existing file, we use**
(a) save (b) SaveAs
(c) print (d) scan.

**47. Header appears on the ..... of the page?**
(a) top (b) bottom
(c) centre (d) side.

**48. The collection of Microsoft tools for preparation of documents, spreadsheets, presentations, database management, time scheduling and mailing is called ..... .**
(a) MS Office (b) OpenOffice.org
(c) Star Office (d) Libre Office.

**49. In MS Office, ..... is the software for preparation of documents.**
(a) MS Access (b) MS Word
(c) MS Excel (d) MS Powerpoint.

**50. The default extension for an MS Word document is ..... .**
(a) .docx (b) .doc
(c) both (a) and (b) (d) neither (a) nor (b).

**51. MS Word can be used for the preparation of ..... .**
(a) letters (b) books/ reports/theses
(c) brochures/ visiting cards (d) all of these.

**52. In Graphical User Interface (GUI) based programs, WYSWYG stands for ..... .**
(a) Whatever You See, Wherever You Get
(b) What You See, What You Get
(c) Whichever You See, What You Get
(d) Wherever You See, What You Get.



**53. The paradigm of WYSWYG signifies that ..... .**
(a) the printed document resembles exactly what you see on screen
(b) printed document is different from that on screen
(c) screen document is better than printed one
(d) printed one is better than screen document.

**54. ..... in MS Word serves as a standard typeset document for creating professional looking documents.**
(a) Macro (b) XML
(c) Template (d) HTML.

**55. The collection of artworks/images available in MS Office is called ..... .**
(a) drawing (b) images
(c) cliparts (d) tables.

**56. To create mail merged results, MS Word can take address input from ..... .**
(a) MS Excel (b) MS Access
(c) Text files (d) all of these.

**57. In MS Word, grammatic errors are highlighted by ..... .**
(a) bold text (b) green underline
(c) red underline (d) italic text.

**58. MS Word can handle ..... to enrich a document.**
(a) lists (b) images
(c) tables (d) all of these.

**59. The text or image which appears faintly in the background of a page is called ..... .**
(a) Watermark (b) Trademark
(c) Copyright (d) Embossing.

**60. MS Office button is located on the ..... of MS Word window.**
(a) top right (b) top left
(c) bottom left (d) bottom right.

**61. ..... is the shortcut to open Office menu of MS Word.**
(a) Alt + H (b) Alt + N
(c) Alt + P (d) Alt + F.

**62. The save button is MS Office menu can be accessed through ..... .**
(a) Alt + F + S (b) Ctrl + S
(c) both Alt + F + S and Ctrl + S (d) none of these.

**63. To access SaveAs item in Office menu of MS Word, use ..... shortcut.**
(a) Alt + F + A (b) Ctrl + O
(c) Ctrl + N (d) Ctrl + P.

64. To select Open item in Office menu of MS Word, use ..... shortcut.
(a) Ctrl + O (b) Alt + F + O
(c) Both Ctrl + O and Alt + F + O (d) Ctrl + S

65. For Close item in MS Office menu, use ..... shortcut.
(a) Alt + F + A (b) Ctrl + O
(c) Ctrl + N (d) Alt + F + C.

66. The first menu, containing most common tools required for preparation of document in MS Word, is called ..... .
(a) Home (b) Insert
(c) Page Layout (d) References.

67. The tools for Clipboard, Font Style,Paragraph Formatting, Styles and Search are contained in ..... menu.
(a) Home (b) Insert
(c) Page Layout (d) References.

68. ..... is the shortcut for Home menu in MS Word.
(a) Alt + H (b) Alt + N
(c) Alt + P (d) Alt + S.

69. ..... menu permits insertion of tables, images, drawing objects and hyperlinks, headers and footers in MS Word.
(a) Home (b) Insert
(c) Page Layout (d) References.

70. ..... is the shortcut for Insert menu in MS Word.
(a) Alt + H (b) Alt + N
(c) Alt + P (d) Alt + S.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (a) | 2. | (a) | 3. | (d) | 4. | (d) | 5. | (c) | 6. | (c) | 7. | (b) | 8. | (b) |
| 9. | (c) | 10. | (b) | 11. | (b) | 12. | (a) | 13. | (a) | 14. | (a) | 15. | (a) | 16. | (a) |
| 17. | (b) | 18. | (a) | 19. | (d) | 20. | (a) | 21. | (c) | 22. | (c) | 23. | (a) | 24. | (a) |
| 25. | (c) | 26. | (d) | 27. | (d) | 28. | (d) | 29. | (c) | 30. | (a) | 31. | (a) | 32. | (c) |
| 33. | (b) | 34. | (a) | 35. | (b) | 36. | (c) | 37. | (a) | 38. | (c) | 39. | (c) | 40. | (d) |
| 41. | (b) | 42. | (c) | 43. | (b) | 44. | (c) | 45. | (d) | 46. | (b) | 47. | (a) | 48. | (a) |
| 49. | (b) | 50. | (c) | 51. | (d) | 52. | (b) | 53. | (a) | 54. | (c) | 55. | (c) | 56. | (d) |
| 57. | (b) | 58. | (d) | 59. | (a) | 60. | (b) | 61. | (d) | 62. | (c) | 63. | (a) | 64. | (c) |
| 65. | (d) | 66. | (a) | 67. | (a) | 68. | (a) | 69. | (b) | 70. | (b). | | | | |



# 6. Excel

- Microsoft Excel is a spreadsheet program that is used to record and analyse numerical data. Think of a spreadsheet as a collection of columns and rows that form a table. Alphabetical letters are usually assigned to columns and numbers are usually assigned to rows. The point where a column and a row meet is called a cell. The address of a cell is given by the letter representing the column and the number representing a row.
- We all deal with numbers in one way or the other. We all have daily expenses which we pay for from the monthly income that we earn. For one to spend wisely, they will need to know their income vs. expenditure. Microsoft Excel comes in handy when we want to record, analyse and store such numeric data.
- Running Excel is not different from running any other Windows program. If you are running Windows with a GUI like (Windows XP, Vista and 7) follow the following steps:

(1) Click on start menu.
(2) Point to all programs.
(3) Point to Microsoft Excel.
(4) Click on Microsoft Excel.

Alternatively, you can also open it from the start menu if it has been added there. You can also open it from the desktop shortcut if you have created one.

- The ribbon provides shortcuts to commands in Excel. A command is an action that the user performs. An example of a command is creating a new document, printing a documenting etc.

**Ribbon start button:** It is used to access commands *i.e.* creating new documents, saving existing work, printing, accessing the options for customizing excel etc.

**Ribbon tabs:** The tabs are used group similar commands together. The home tab is used for basic commands such as formatting the data to make it more presentable, sorting and finding specific data within the spreadsheet.

**Ribbon bar:** The bars are used to group similar commands together. As an example, the alignment ribbon bar is used to group all the commands that are used to align data together.

- **A worksheet is a collection of rows and columns:** When a row and a column meet, they form a cell. Cells are used to record data. Each cell is uniquely identified using a cell address. Columns are usually labelled with letters while rows are usually numbers.
- **A workbook is a collection of worksheets:** By default, a workbook has three cells in Excel. You can delete or add more sheets to suit your requirements. By default, the sheets are named Sheet 1, Sheet 2 and so on forth. You can rename the sheet names to more meaningful names *i.e.* Daily Expenses, Monthly Budget etc.
- There are numbers of spreadsheet programs but from all of them, Excel is most widely used. People have been using it for last 30 years and throughout

these years, it has been upgraded with more and more features. The best part about Excel is, it can apply to many business tasks, including statistics, finance, data management, forecasting, analysis, inventory, billing and business intelligence.

Following are the few things which Excel can do for you:

(1) Number Crunching
(2) Charts and Graphs
(3) Store and Import Data
(4) Manipulating Text
(5) Templates/Dashboards
(6) Automation of Tasks
(7) And Much More...

Three most important components of Excel is which you need to understand first:

**1. Cell:** A cell is a smallest but most powerful part of a spreadsheet. You can enter your data into a cell either by typing or by copy-paste. Data can be a text, a number, or a date. You can also customize it by changing its size, font color, background color, borders etc. Every cell is identified by its cell address, cell address contains its column number and row number (If a cell is on 11th row and on column AB, then its address will be AB11).

**2. Worksheet:** A worksheet is made up of individual cells which can contain a value, a formula, or text. It also has an invisible draw layer, which holds charts, images and diagrams. Each worksheet in a workbook is accessible by clicking the tab at the bottom of the workbook window. In addition, a workbook can store chart sheets; a chart sheet displays a single chart and is accessible by clicking a tab.

**3. Workbook:** A workbook is a separate file just like every other application has. Each workbook contains one or more worksheets. You can also say that a workbook is a collection of multiple worksheets or can be a single worksheet. You can add or delete worksheets, hide them within the workbook without deleting them and change the order of your worksheets within the workbook.

## Components of Excel Window

**1. Active Cell:** A cell which is currently selected. It will be highlighted by a rectangular box and its address will be shown in the address bar. You can activate a cell by clicking on it or by using your arrow buttons. To edit a cell, you Double-click on it or use F2 to as well.

**2. Columns:** A column is a vertical set of cells. A single worksheet contains 16384 total columns. Every column has its own alphabet for identity, from A to XFD. You can select a column clicking on its header.

**3. Rows:** A row is a horizontal set of cells. A single worksheet contains 1048576 total rows. Every row has its own number for identity, starting from 1 to 1048576. You can select a row clicking on the row number marked on the left side of the window.

**4. Fill Handle:** It's a small dot present on the lower right corner of the active cell. It helps you to fill numeric values, text series, insert ranges, insert serial numbers etc.

**5. Address Bar:** It shows the address of the active cell. If you have selected more than one cell, then it will show the address of the first cell in the range.



**6. Formula Bar:** The formula bar is an input bar, below the ribbon. It shows the content of the active cell and you can also use it to enter a formula in a cell.

**7. Title Bar:** The title bar will show the name of your workbook, followed by the application name ("Microsoft Excel").

**8. File Menu:** The file menu is a simple menu like all other applications. It contains options like (Save, SaveAs, Open, New, Print, Excel Options, Share etc.)

**9. Quick Access Toolbar:** A toolbar to quickly access the options which you frequently use. You can add your favourite options by adding new options to quick access toolbar.

**10. Ribbon Tab:** Starting from the Microsoft Excel 2007, all the options menus are replaced with the ribbons. Ribbon tabs are the bunch of specific option group which further contains the option.

**11. Worksheet Tab:** This tab shows all the worksheets which are present in the workbook. By default you will see, three worksheets in your new workbook with the name of Sheet 1, Sheet 2, Sheet 3 respectively.

**12. Status Bar:** It is a thin bar at the bottom of the Excel window. It will give you an instant help once you start working in Excel.

## Microsoft Excel Basic Functions

Functions are one of the most important features of Excel. It helps you to perform the basic calculations as well complex. Below listed 10 Basic Excel Functions which you need to learn:

**1. SUM:** It returns the sum of numeric values in a cell. You can refer to the cells where you have values or simply insert the values into the function [...].

**2. COUNT:** It returns the count of numeric values in a cell. You can refer to the cells where you have values or simply insert the values into the function [...].

**3. AVERAGE:** It returns the average of numeric values in a cell. You can refer to the cells where you have values or simply insert the values into the function [...].

**4. TIME:** It returns a valid time serial number as per Excel's time format. You need to specify hours, minutes and seconds [...].

**5. DATE:** It returns a valid date serial number as per Excel's time format. You need to specify day, month and year [...].

**6. LEFT:** This function extracts specific characters from a cell/string starting from the left (start). You need to specify the text and number of characters to extract [...].

**7. RIGHT:** This function extracts specific characters from a cell/string starting from the right (last). You need to specify the text and number of characters to extract [...].

**8. VLOOKUP:** It looks up for a value in a column and can return that value or a value from the correspondent columns using same row number [...].

**9. IF:** This function returns a value when the specific condition is TRUE and returns another values it condition is FALSE [...].

**10. NOW:** It returns the current date and time in the cell where you insert it using system's settings [...].

**=IF[(SUM(C1:C10) > SUM(D1:D10), SUM(C1:C10), SUM(D1:D10)]**—An example of a complex IF logic. First, it sums C1 to C10 and D1 to D10, then it compares the sum. If the sum of C1 to C10 is greater than the sum of D1 to D10, then it makes the value of a cell equal to the sum of C1 to C10. Otherwise, it makes it the SUM of C1 to C10.

**6. TRIM:** The **TRIM function** makes sure your functions do not return errors due to unruly spaces. It ensures that all empty spaces are eliminated. Unlike other functions that can operate on a range of cells, TRIM only operates on a single cell. Therefore, it comes with the downside of adding duplicated data in your spreadsheet.

**=TRIM(text)**

Example:

**TRIM(A2)**—Removes empty spaces in the value in cell A2.

**7. MAX and MIN:** The **MAX** and **MIN** functions help in finding the maximum number and the minimum number in a range of values.

**=MIN(number1, [number2], ...)**

Example:

**=MIN(B2:C11)**—Finds the minimum number between column B from B2 and column C from C2 to row 11 in both columns B and C.

**=MAX(number1, [number2], ...)**

Example:

**=MAX(B2:C11)**—Similarly, it finds the maximum number between column B from B2 and column C from C2 to row 11 in both columns B and C.

### Important Excel Shortcuts

| | |
|---|---|
| Ctrl + P | Used to open the print dialogue window |
| Ctrl + N | Creates a new workbook |
| Ctrl + S | Saves the current workbook |
| Ctrl + C | Copy contents of current select |
| Ctrl + V | Paste data from the clipboard |
| SHIFT + F3 | Displays the functions insert dialog window |
| SHIFT + F11 | Creates a new worksheet |
| F2 | Check formula and cell range covered |

## Multiple Choice Questions ▼

**1. What is the extension file excel 2004?**

(a) .xls (b) .excel
(c) .xcel (d) .xcl.

**2. What is the extension file excel 2007 and above?**

(a) .xls (b) .excel
(c) .xlsx (d) .xcl.

**3. Worksheet is also called an array of ..... .**

(a) column (b) cells
(c) box (d) formula.

4. How Cells are named in MS Excel?
(a) Alphabetically (b) Numerically
(c) Alphanumerically (d) Special Character.

5. What is the maximum limit of rows in MS Excel 2010?
(a) 1084567 (b) 1048567
(c) 1048576 (d) 1084576.

6. What is the maximum limit of column in MS Excel 2010?
(a) 16384 (b) 16438
(c) 16843 (d) 16348.

7. Which bar lies top of the window in Excel Screen?
(a) Status Bar (b) Ruler
(c) Title Bar (d) Scroll Bar.

8. How rows are numbered in MS Excel?
(a) Alphabetically (b) Numerically
(c) Alphanumerically (d) Special characters.

9. How columns are named in MS Excel?
(a) Alphabetically (b) Numerically
(c) Alphanumerically (d) Special characters.

10. Which tab is used to include pivot table, charts, hyperlinks to a spread sheet?
(a) Insert (b) Page Layout
(c) Data (d) Review.

11. Which tab in Excel is used when importing, querying, outlining and subtotaling the data placed into a worksheet's data list?
(a) Formula (b) Data
(c) Review (d) Insert.

12. Which tab in Excel is used for proofing, protecting and marking up a spread sheet?
(a) Formula (b) Data
(c) Review (d) View.

13. Which tool in MS office is best for organizing data and making lists?
(a) Access (b) Excel
(c) Power Point (d) Word.

14. What is the file extension of Excel 2010?
(a) xls (b) xlsb
(c) xlsm (d) xlsx.

15. How does the single element in a worksheet known as in Excel?
(a) Cell (b) Column
(c) Range (d) Row.



16. What do you mean by A3,B13:B20,C7 reference in Excel?
(a) Range (b) Union
(c) Formula (d) General.

17. Which type of key should combine with Ctrl key to create a macro key in Excel?
(a) Numeric (b) Alphabetic
(c) Alphanumeric (d) Special characters.

18. Which bar is used to display the sheet information and insertion point location in MS Excel?
(a) Ruler (b) Scroll Bar
(c) Status Bar (d) Title Bar.

19. Which tab is used to change the display of worksheet area and the data it contains?
(a) Page Layout (b) Data
(c) Review (d) View.

20. Which view in Excel displays the pages exactly as they appear when printed?
(a) Custom View (b) Full screen View
(c) Page Break View (d) Page Layout view.

21. Which tab is used for creating, formatting and editing a spreadsheet?
(a) Data (b) Home
(c) Insert (d) Review.

22. Which function is used to count the number of cells that contain numbers, in a range?
(a) Count( ) (b) Countif( )
(c) Sum( ) (d) Sumif( ).

23. Which function is used to add the values in a range?
(a) Count( ) (b) Sum( )
(c) ABS( ) (d) Sumif( ).

24. Which symbol is used to execute formulas in MS Excel?
(a) = (b) ‘
(c) # (d) “.

25. Where does the result displays when a formula is entered in Excel?
(a) Current Cell (b) Next Cell
(c) Previous Cell (d) Formula Bar.

26. Which function in Excel is used to find the biggest value in a range?
(a) Ceiling (b) DMAX
(c) LEN (d) MAX.

27. Which one of the following is a text function in MS Excel?
(a) MID( ) (b) NOW( )
(c) COUNT( ) (d) SIGN.

28. Which one of the following is a 'Date and Time' function in Excel?
(a) FIND( )
(b) MOD( )
(c) NOW( )
(d) MID( ).

29. Which function is used to find the middle number in a range?
(a) MEDIAN( )
(b) MID( )
(c) TRIM( )
(d) MODE( ).

30. What is the purpose 'Tab' key in MS Excel?
(a) Moves cell pointer to previous column
(b) Moves cell pointer to next column
(c) Moves cell pointer previous row
(d) Moves cell pointer next row.

31. What is the purpose of 'Enter Key' in MS Excel?
(a) Moves cell pointer to previous column
(b) Moves cell pointer to next column
(c) Moves cell pointer to previous row
(d) Moves cell pointer to next row.

32. Which function key is used to open go to dialogue box in MS Excel?
(a) F2
(b) F5
(c) F7
(d) F11.

33. Which option in MS Excel is used to display the rows that meet certain conditions?
(a) Find
(b) Filter
(c) Format
(d) Sort.

34. Which option in Excel is used to rearrange the rows base on the content of a particular column?
(a) Find
(b) Filter
(c) Sort
(d) Format.

35. Which type of addressing is used to keep rows constant and column changes and vice versa while copying a formula from one area of the worksheet to another in Excel?
(a) Mixed
(b) General
(c) Relative
(d) Absolute.

36. Which one of the following is 'no argument' function?
(a) Now( )
(b) Lower( )
(c) Max( )
(d) IF( ).

37. Which key is used to move the insertion point to the beginning of the current sheet?
(a) Pageup
(b) Home
(c) Ctrl + pageup
(d) Ctrl + Home.

38. Which key is used to make multiple line in a single cell?
(a) Alt + ↵
(b) Tab + ↵
(c) Ctrl + ↵
(d) Shift + ↵.



39. Columns in MS Excel are named in the form of ..... .
(a) alphabets (A, B, C, D, ...)
(b) numbers (1, 2, 3, 4, ...)
(c) roman numerals (I, II, III, IV, ...)
(d) none of these.

40. Rows in MS Excel are named in the form of ..... .
(a) alphabets (A, B, C, D, ...)
(b) numbers (1, 2, 3, 4, ...)
(c) roman numerals (I, II, III, IV, ...)
(d) none of these.

41. The intersection of a row and column in MS Excel is called ..... .
(a) spreadsheet
(b) workbook
(c) document
(d) cell.

42. The cell having and column number 3 and row number 6 is denoted by the name ..... .
(a) F3
(b) C6
(c) C3
(d) F6.

43. In MS Excel, a function is entered by typing ..... symbol first.
(a) @
(b) $
(c) #
(d) =.

44. MS Excel can ..... given data.
(a) sort
(b) statistically analyse
(c) draw graphs for
(d) all of these.

45. The latest version of MS Excel can have ..... rows.
(a) 10,48,576
(b) 16,384
(c) 1,024
(d) 512.

46. The latest version of MS Excel can have ..... columns.
(a) 10,48,576
(b) 16,384
(c) 1,024
(d) 512.

47. Excel supports recording of repeated actions with the help of ..... .
(a) graph
(b) chart
(c) macro
(d) other applications.

48. MS Excel macros can be invoked using ..... .
(a) button
(b) keystroke
(c) both (a) and (b)
(d) neither (a) nor (b).

49. MS Excel supports a version of Visual Basic called ..... for programming.
(a) Javascript
(b) Visual Basic for Applications (VBA)
(c) ASP.NET
(d) C#.NET.

50. Each sheet in MS Excel file is called a ..... .
(a) workbook
(b) worksheet
(c) notesheet
(d) notebook.

**51.** By default, Excel worksheets are named ..... .
(a) book1, book2, book3, ...
(b) sheet1, sheet2, sheet3, ...
(c) page1, page2, page3, ...
(d) note1, note2, note3, ...

**52.** Excel file without any macros has the default extension of ..... .
(a) .xlsx (b) .xls (c) .xlsm (d) .xlst.

**53.** Excel file containing macros has the default extension of ..... .
(a) .xlsx (b) .xls (c) .xlsm (d) .xlst.

**54.** MS Excel can reference data in ..... .
(a) the same sheet
(b) different sheet in the same workbook
(c) different sheet in a different workbook
(d) all of the above.

**55.** In MS Excel, the common type of data applicable to any cell is called ..... data type.
(a) General (b) Number (c) Currency (d) Text.

**56.** In MS Excel, the data type suitable for handling numbers is called ..... data type.
(a) General (b) Number (c) Currency (d) Text.

**57.** In MS Excel, number data type can control the ..... .
(a) digit grouping
(b) number of decimal places
(c) both (a) and (b)
(d) neither (a) nor (b).

**58.** In MS Excel, numbers can be grouped and prefixed with a currency symbol using ..... data type.
(a) Accounting
(b) Currency
(c) both (a) and (b)
(d) neither (a) nor (b).

**59.** In MS Excel, ..... data type is suitable for handling dates.
(a) Date (b) Time (c) Percentage (d) Fraction.

**60.** In MS Excel, ..... data type is suitable for handling time values.
(a) Date (b) Time (c) Percentage (d) Fraction.

**61.** In MS Excel, ..... data type takes values between 0 and 1 and displays them in percentage format.
(a) Date (b) Time (c) Percentage (d) Fraction.

**62.** In MS Excel, ..... data type displays decimal fractions as vulgar or mixed fractions.
(a) Date (b) Time (c) Percentage (d) Fraction.

**63.** In MS Excel, ..... data type displays numbers in scientific notation.
(a) Scientific
(b) Text
(c) Custom
(d) Date.



**64.** In MS Excel, ..... data type is suitable for names and other character sequences.
(a) Scientific (b) Text (c) Custom (d) Date.

**65.** In MS Excel, ..... data type supports formatting of numbers with suitable customization.
(a) Scientific (b) Text (c) Custom (d) Date.

**66.** In MS Excel, for the number 45453453 to be displayed as 4,54,53,453.0, the custom format could be ..... .
(a) ##,##,##,##0.0
(b) ###,###,##0.0
(c) ########0.0
(d) ##,##,##,###.#.

**67.** In custom formatting of numbers, an optional digit is denoted by ..... symbol.
(a) 0 (b) # (c) $ (d) ^.

**68.** In custom formatting of numbers, a compulsory/mandatory digit is denoted by ..... symbol.
(a) 0 (b) # (c) $ (d) ^.

**69.** When copying and pasting an excel formula, the method which permits formula to progressively update cell references is called ..... referencing system.
(a) static (b) semi-relative (c) relative (d) none of these.

**70.** When copying and pasting an excel formula, the method which permits formula to progressively update either column reference or row reference (but not both column and row references) is called ..... referencing system.
(a) static (b) semi-relative (c) relative (d) none of these.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (a) | 2. | (c) | 3. | (b) | 4. | (c) | 5. | (c) | 6. | (a) | 7. | (c) | 8. | (b) |
| 9. | (a) | 10. | (a) | 11. | (b) | 12. | (c) | 13. | (b) | 14. | (d) | 15. | (a) | 16. | (a) |
| 17. | (b) | 18. | (c) | 19. | (d) | 20. | (d) | 21. | (b) | 22. | (a) | 23. | (b) | 24. | (a) |
| 25. | (a) | 26. | (d) | 27. | (a) | 28. | (c) | 29. | (a) | 30. | (b) | 31. | (d) | 32. | (b) |
| 33. | (b) | 34. | (c) | 35. | (a) | 36. | (a) | 37. | (d) | 38. | (a) | 39. | (a) | 40. | (b) |
| 41. | (d) | 42. | (b) | 43. | (d) | 44. | (d) | 45. | (a) | 46. | (b) | 47. | (c) | 48. | (c) |
| 49. | (b) | 50. | (b) | 51. | (b) | 52. | (a) | 53. | (c) | 54. | (d) | 55. | (a) | 56. | (b) |
| 57. | (c) | 58. | (c) | 59. | (a) | 60. | (b) | 61. | (c) | 62. | (d) | 63. | (a) | 64. | (b) |
| 65. | (c) | 66. | (a) | 67. | (b) | 68. | (a) | 69. | (c) | 70. | (b). | | | | |

# Unit-IV

## Web Surfing

### History of Internet

The Internet was established in 1969 by the US Department of Defence. It was first named as ARPANET. Initially this was done for military use only. Its main function was to maintain a smooth communication system for military use in times of war, but later institutions doing research on defence related matters were also attached to it. Then it was named Internet. In the late 1980s, the National Science Foundation's NSF NET began its network, making the Internet available to computer science graduates and university professors.

As a result of a law made in 1991, NSF NET was renamed as NREN (National Research and Educational Network) and its scope was expanded and its commercial use was allowed. In this way, today's Internet is in front of you, where every place in the world is connected to another place through Internet. Today, thousands and millions of information are available on the Internet for business information of any kind, direct contact with the bank, availability of government information for experts etc.

Today, in relation to the Internet, we can say that the Internet is such a global collection of high-capacity computers, which provide various information to the network users by connecting to each other through network cables, telephone cables, microwave dies, satellites etc.

**How the Internet works**

The working of the Internet is not controlled by any one particular organization. It is managed by a group of voluntary organizations. These voluntary organizations have formed the Internet Society. They decide the rules, known as protocols, for communication over the Internet. Different networks may have their own rules, which they follow internally. But when they interact with each other they have to follow some general rules.

**Protocol:** To establish a connection between different computers, it is necessary to follow some special rules, these are called 'protocol'. By following these rules, different types of computer systems and operating systems can be interconnected. Through these computers of two different settings are able to exchange information with each other. The communication protocol used by the Internet is TCP/IP.

**Transmission Control Protocol or TCP:** Through this, the computer is able to transmit information over the network. The TCP protocol divides the information into small packets and ensures its sending to the correct address. If an information packet is lost in route, it retransmits it.

**Internet Protocol or IP:** Its main function is to write the address of the destination computer on the information packets, so that these packets can reach from one computer to another computer on the Internet by the fastest route. It also serves as routing for information packets.

**Benefits of Internet:** Following are some of the special benefits of internet:

(1) E-mails can be sent through the Internet.



(2) With the help of Internet, we can play different types of entertaining games.

(3) Communications and messages can be exchanged with any person connected to the Internet through the Internet, which is called chatting.

(4) Shopping can be done through the Internet, advertisements can be given, jobs can be applied for.

(5) Using the Internet, you can participate in various competitions, create your own website.

(6) It is also possible to do business through the Internet.

(7) Internet opens up new dimensions of employment. For example, cyber cafes or Internet cafes. In these cafes tea and coffee facilities as well as computer facilities are also available. Any type of information can be obtained using the Internet on the computers available here.

(8) Businesses and organizations use the Internet to get facilities such as sound and video conferencing, so that work can be done easily between remote people.

(9) Media and entertainment companies use the Internet in the transmission of audio and video, transmission of live radio and television programs. They also broadcast online chat group programs. In these programs, people can discuss and exchange written messages even when they are far away from each other.

**How to Work with Internet**

To work on the Internet, we need to know some related words, such as web browsers, web page, website etc. It is very important to know how to connect to the Internet and how to use it after joining.

**Web browsers:** On the Internet, when a user opens various sites on his computer and views or stores the information available on these sites, then this process is called 'Net Surfing'.

During net surfing, the software which is needed the most is called browser. Thus, a browser is a program that takes you to various sites on the net and displays the content or information available on them on your computer. To open a site, you have to give the address or URL of that site to the browser. By entering the URL of the site in the address bar of the browser, the browser displays the home page of that site on your computer.

In fact, browsers help in accessing various resources or information available on the world wide web (www means hypertext files, as described earlier.). However, other types of file systems can also be accessed by them. By the way, there are many browsers available in the market, such as Netscape Navigator, Mozilla Fire Fox, Opera, Safari, Internet Explorer, Google Chrome etc. Of these, Google Chrome is more popular.

There may be some variation in the form of these documents, *i.e.*, the features provided in them may be of different types depending on the browser you have selected.

**(i) Web pages:** Documents located on websites are called Web pages. Web pages use http. There are many facts related to web pages which will be beneficial to understand. Their description is as follows:

**(a) Home page:** This is the top-level page of a website. When the website is opened, its 'home page' is the first thing that appears.

**(b) Web portal:** This is a website that hosts other websites. In other words, a web portal contains hyperlinks to many other websites. By clicking on these links, the respective websites can be opened. www.yahoo.com is an example of a web portal. Other examples are : www.indiatimes.com, www.khoj.com etc.

**(ii) Hyper Text Transfer Protocol:** Hyper Text transfer protocol (http) is a method of accessing web pages over the Internet. It is a primary access method for making connections on the Internet. HTTP usually works with www. HTTP serves to access hypertext documents on the World Wide Web. Since the World Wide Web allows the use of multimedia files over the 'net' and hypertext files contain multimedia elements, http generally works with WWW. When the first part of a URL is http; Like http://www.w3schools.com It then indicates that the local software on your machine is asking for an http file.

**World wide web:** When information is being viewed under www, then if further information related to the available information will be on another computer and when the user brings the mouse pointer to that information, it will be informed by a special symbol that other information related to it will also be there are available. If the user selects the relevant option to view that information, then that information from the other computer will appear on the user's screen. A similar arrangement can be made in the information received now. The computers from which this information is being received may be in different countries or continents. Thus, the name of this means of obtaining information from the computers of the world, the World Wide Web, is similar to its function.

A separate browser software was developed for viewing information under www. The name of the first browser made for this was Mosaic. Netscape Communication was Microsoft companies have also made browsers for this. When any information or document is being viewed under www, then that part of that information or document, about which information is available elsewhere, appears in a different color, so that the user knows that if there is more information about this subject. If information is needed, then he can select the option to see other information by bringing the pointer on that line.

**Uniform resource locator:** Any one location on the net server is called website. Each website has a unique address called a URL (Uniform Research Locator). For example, the address or URL of Microsoft's website is http://www.microsoft.com.

**Connecting to the Internet**

**Broadband connectivity:** Today many broadband technologies are being introduced by the telecom industry. Broadband is the term used to describe a data connection that can transmit data using a modem at a rate much higher than the speed of data transmission through a standard dial-up connection. It is ideal for home and small business that require high speed Internet.

**Wi-Fi band:** Nowadays wireless connections are also available. For this, we need a Wi-Fi card, which is installed in the computer and a wireless modem. When we connect to the Internet, we need to know its speed parameter. The measurement of Internet speed is represented by the number of bit transfers per unit. Generally Internet speed is measured in KBPS (Kilo Bits Per Second), but nowadays some organizations are providing higher speed connections in MBPS (Mega Bits Per Second).



**Search engine:** A search engine is a web-based tool or software, which helps Internet users to search for information on the word wide web (www).

At present, there are many search engines on the Internet, but there is not a single search engine that can provide all the information completely. This is because a search engine is a type of software that needs to be updated from time to time. Updating the search engine takes time and the new information in the meantime cannot be received by the respective search engine. Therefore, there is no search engine that can access all the information available on the Internet at one time.

Internet is a very large and wide worldwide network. Therefore, search engines should also be very powerful and fast working. A large part of the Internet is updated almost regularly; because hundreds of new websites arise on the Internet every day. Therefore, it is very difficult to use the Internet without the help of search engines.

For example, Google, Bing, Yahoo and Yandex are popular search engines. When the user types a word in the search bar, it is called a keyword. Based on these keywords and key phrases, search engines display a long list of web results to the user.

The five major search engines of India are as follows:

(i) www.google.com
(ii) www.bing.com
(iii) www.yahoo.com
(iv) www.yandex.com

**Working of search engine:** 'Keywords' can be typed to search in the search engine and the search engine searches them on the Internet. After doing the search, the search engine presents the complete result to you. The search engine does this work with the help of the following three components:

(i) Spider, WebCrawler, Bots or Agents
(ii) Indexing software and database
(iii) Search algorithm

**Electronic mail (e-mail):** The most widely used service on the Internet is electronic mail or e-mail. This is the oldest service of the Internet. It was started by two computer users to send messages to each other from their computers, but in the present time the e-mail service has expanded greatly and many types of message transmission have started working under it. For example,

(i) Sending the same message to multiple people.
(ii) Incorporating text, sound, images and graphics in a single message.
(iii) Provision for sending messages on networks other than the Internet.
(iv) Sending a message in such a way that the receiver computer can receive the reply message.

Thus, e-mail is a powerful medium to exchange written messages between a particular person or a group of individuals, even when they are geographically far away.

**e-mail address:** To send mail to the mail box, it is necessary to have the address of the mail box. This address is called an e-mail address. It is true that sending and receiving mail is a very simple task, but still it is necessary to know some parameters before sending and receiving mail. One of these parameters is the e-mail address.

Sent e-mails can only be seen by the receiver as they are required to specify their "password" before they can use that e-mail. It is only through this password that the personal mailbox is protected.

The format of the e-mail address is usually as follows:

username@hostname

For example, Some examples of e-mail addresses are as follows:

chitra@hotmail.com
raj@del4.vsnl.net.in
kala-gm@india123.com
startv@vsnl.com
response.zeenews@vsnl.com

**Benefits of e-mail:** The credit for the popularity of e-mail goes to its benefits which are as follows:

**(i) Speed:** This is an instantaneous service. It only takes a few seconds for the message you sent to reach the destination.

**(ii) Inexpensive:** e-mail is a very cheap service for sending information around, while the information has to be delivered at a fast speed. The courier cost for sending a three page letter to the US is around ₹ 300, sending it by fax is around ₹ 100; whereas sending the same letter via e-mail costs only one local telephone call.

**(iii) Simple to use:** The process is very simple. Once the letter is typed, send it wherever you want via e-mail. For this you do not need to go to the post office, paste the stamp and worry about the letter not arriving.

**(iv) Reduction in waste:** The nature of modern offices has changed through e-mail. Computers are being used to keep records of sending and receiving various information, which has reduced the dependence on paper. e-mail has done away with the need for handling of waste papers in offices.

**(v) One to many:** You can prepare a single letter and send it to more than one destination simultaneously or one by one.

**(vi) Maintenance of records:** All e-mail messages are stored in the computer as a file; So you can keep a record of the messages exchanged with any person.

**(vii) Multimedia format:** This is a multimedia medium, that is, you can send sound, pictures, animations and even movies through letters.

**(viii) Permanence:** Sending and receiving a message through e-mail is a permanent medium, that is, you can read the sent and received message patiently.

**Defects of e-mail:** Some of the defects of E-mail are as follows:

**(i) Requirement of hardware:** You always need a computer to read and print e-mails.

**(ii) Decreased quality:** Sometimes due to lack of network, e-mail messages are received half-heartedly or in changed words.

**(iii) Fast medium:** Due to the ease of use of e-mail, sometimes mistakes are made in sending the message, which are later regretted.

**(iv) Emotionless:** Emotions cannot be displayed properly in the exchange of messages, due to which sometimes the receiver does not get a sense of the reality of the message.



## Multiple Choice Questions ▼

1. **Who started the Internet service in India?**
   (a) VSNL (b) ARPANET
   (c) NORSAR (d) NSFNET.

2. **What type of network is the internet?**
   (a) LAN (b) MAN
   (c) WAN (d) None of these.

3. **Internet is used for what purpose**
   (a) Data transmission (b) Data storage and presentation
   (c) Data transfer (d) All of these.

4. **The company that provides internet service to the consumers is called**
   (a) ISP (b) ASP
   (c) IC (d) ISC.

5. **By which technology the information is presented in the www system?**
   (a) Multimedia (b) Hypertext
   (c) Common method (d) e-mail.

6. **What is web browser?**
   (a) Hardware computer part (b) Software program
   (c) An internet device (d) Pointing device.

7. **Which facility can be used through internet?**
   (a) Mail (b) Online chatting
   (c) World Wide Web (d) All of these.

8. **URL means:**
   (a) Uniform Research Limited (b) Uniform Resource Labs
   (c) Uniform Resource Locator (d) Uniform Research Locator.

9. **The area involved in bringing dynamism in the field of commerce is**
   (a) Mobile business
   (b) Head-to-head commerce
   (c) M-commerce
   (d) Mobile communication.

10. **Online learning through internet is called:**
    (a) E-teaching (b) Virtual classes
    (c) E-learning (d) Video conferencing.

11. **What is the internet?**
    (a) Programming language
    (b) Network connecting computers all over the world
    (c) Computer program to transfer data
    (d) All of the above.

**12. What is e-mail?**
(a) Method of exchanging messages *via* electronic devices
(b) Speed message transfer to location
(c) Musical messaging service
(d) None of the above.

**13. E-mail stands for?**
(a) Electrical mail (b) Electronic messaging service
(c) Electronic mail (d) All of these.

**14. What does WWW stand for?**
(a) Working Window Web (b) Web Window Word
(c) World Wide Web (d) None of these.

**15. What is the URL of a website?**
(a) It is the location of website on internet (b) It is used to create internet
(c) It is location of peripheral on internet (d) None of these.

**16. Putting files to the server from the computer is**
(a) Downloading (b) Uploading
(c) Trashing (d) Transferring.

**17. What does FTP stand for?**
(a) Folder Text Protocol (b) File Transfer Push
(c) Fixed Terminology Placement (d) File Transfer Protocol.

**18. The address of a website is also known as**
(a) Location (b) Mail id
(c) URL (d) None of these.

**19. Which of these is a non-profit domain?**
(a) .com (b) .in
(c) .org (d) All of these.

**20. The World Wide Web (WWW) was invented by ..... .**
(a) Steve Jobs (b) Tim Berners Lee
(c) Ray Tomlinsou (d) All of these.

**21. Where are e-mails received or sent to users?**
(a) Physical Address (b) E-mail Address
(c) Website Location (d) None of these.

**22. Which of these is correct e-mail address?**
(a) userName@website@com (b) userName.website.com
(c) userName.website@com (d) userName@website.com.

**23. Which of these is an e-mail provider?**
(a) G-mail (b) Hotmail
(c) Yahoo (d) All of these.



**24. In which year e-mail was created?**
(a) 1980 (b) 1990
(c) 1971 (d) 1975.

**25. Who invented e-mail?**
(a) Larry Page (b) Tim Berners
(c) Ray Tomlinson (d) All of these.

**26. The "S" in HTTPS stands for**
(a) Selected (b) Secure
(c) Software (d) System.

**27. "@" in an e-mail address is used to ..... .**
(a) separate username from ISP (b) create password for e-mail
(c) add strength to email (d) none of these.

**28. ISP stands for**
(a) Internet Security Platform (b) Internet Service Provider
(c) Instant Service Processor (d) None of these.

**29. Which of these can be done using an e-mail?**
(a) Share data (b) Validate accounts
(c) Send or receive e-mail (d) All of these.

**30. Which of these services is owned by Google?**
(a) Yahoo mail (b) G-mail
(c) Facebook (d) All of these.

**31. Is it possible to send images *via* e-mail?**
(a) Yes (b) No.

**32. Which folder contains Junk e-mails?**
(a) Inbox (b) Unwanted
(c) Spam (d) None of these.

**33. Which of these e-mail service providers is free?**
(a) Tutanota (b) G-mail
(c) Mailchimp (d) All of these.

**34. SMTP stands for**
(a) Simple Mail Text Processing (b) Secure Mail Transfer Protocol
(c) Simple Mail Transfer Protocol (d) Secure Message Transfer Process.

**35. OTP stands for**
(a) One Time Password (b) Over Time Process
(c) One Time Process (d) All of these.

**36. Which of these is not required to login to an e-mail?**
(a) E-mail (b) Physical address
(c) Password (d) None of these.

**37.** Which of these is required while signing up to an e-mail?
(a) Phone Number (b) Name
(c) Password (d) All of these.

**38.** Is it possible to login to an e-mail without completing verification
(a) Yes (b) No.

**39.** A good password must contain
(a) capital and small case alphabets (b) at least one number
(c) at least one alphanumeric character (d) all of these.

**40.** What is the initial network communication called?
(a) Micronet (b) ARPANET
(c) Network (d) APRENET.

**41.** Why is the IP address of a computer required?
(a) Identify it on internet (b) Play music
(c) Access e-mail account (d) None of these.

**42.** What does IP stand for?
(a) Internet Process (b) Instant Processing
(c) Internet Protocol (d) Information Program.

**43.** Internet can be accessed using which of these software's?
(a) Gaming Program (b) Music Player
(c) Web Browser (d) All of these.

**44.** Which of these are web browsers
(a) Google Chrome (b) Internet Explorer
(c) Brave (d) All of these.

**45.** What does XML stand for?
(a) Extra Multiplicative Logic (b) Extensible Markup Language
(c) Export Markup Language (d) None of these.

**46.** What will happen if the e-mail does not contain the subject while sending?
(a) Mail will not be sent
(b) Mail will be sent normally
(c) Prompt asking to send mail without subject
(d) None of the above.

**47.** Which of these is required to send mail?
(a) Email id (b) Image
(c) Link (d) All of these.

**48.** What is BCC in e-mail?
(a) Block Content Creation (b) Behind Content Copy
(c) Blind Carbon Copy (d) None of these.

**49.** Is there an option to restrict the user to forward the e-mail in G-mail?
(a) Yes (b) No.



**50.** Which of these are jargons in e-mail?
(a) BTW (b) RSN (c) TIA (d) All of these

**51.** What is an e-mail sent to multiple recipients at once called?
(a) Creator e-mail (b) Bulk e-mail
(c) Digital marketing (d) None of these.

**52.** TCP stands for
(a) Total Communication Platform (b) Transmission Control Protocol
(c) Technical Communication Platform (d) All of these.

**53.** Which of these are layer of TCP/IP protocol?
(a) Data link layer (b) Transport layer
(c) Physical layer (d) All of these.

**54.** What does ARP stand for?
(a) Application Resolution Protocol (b) Actual Resolution Project
(c) Address Resolution Protocol (d) None of these.

**55.** How many layers does the OSI model have?
(a) 5 (b) 6 (c) 7 (d) 10.

**56.** In which year is the OSI model introduced?
(a) 1995 (b) 1972 (c) 1983 (d) 1999.

**57.** What does OSI stand for?
(a) One Standard Interconnection (b) Open Source Interconnection
(c) One Source Internet (d) None of these.

**58.** Which of these is not a layer of the OSI model?
(a) Connection layer (b) Data link layer
(c) Session layer (d) Network layer.

**59.** Which layer is responsible for encryption of data?
(a) Session layer (b) Network layer
(c) Data link layer (d) Presentation layer.

**60.** We get list of sites after typing a word in search bar called ..... .
(a) key phrase (b) single word
(c) double word (d) None of these.

**61.** The search results are generally presented in a line of results often referred to as ..... .
(a) Category List (b) Tag list
(c) Search Engine Results Pages (d) Search Engine Pages

**62.** Search engines maintain heavy database of keywords and urls
(a) True (b) False.

**63.** Web search engines stores information about many web pages by a ..... .
(a) Web Indexer (b) Web Crawler
(c) Web Organizer (d) Web Router.

**64. Web Crawler is also called as ..... .**
(a) Link Directory (b) Web Spider
(c) Web Manager (d) Search Optimizer.

**65. Search engine optimization is the process of ..... of a website or a web page in a search engine's search results.**
(a) affecting the visibility (b) getting meta tags
(c) generating cached files (d) none of these.

**66. SEO is to improve the volume and ..... to a web site from search engines.**
(a) look and feel (b) advertisement
(c) quality of traffic (d) none of these.

**67. A keyword search engines**
(a) allows all users to change its content
(b) returns a list of sites that have been reviewed by humans
(c) returns a list of sites based on the search terms you enter
(d) searches a variety of other search engines.

**68. A subject-oriented search engine**
(a) allows all users to change its content
(b) returns a list of sites based on the list of search terms you enter
(c) returns a list of sites that have been reviewed by humans
(d) searches a variety of other search engines.

**69. A meta search engine**
(a) returns a list of sites that have been reviewed by humans
(b) allows all users to change its content
(c) returns a list of sites based on the list of search terms you enter
(d) searches a variety of other search engines.

**70. Compared to subject directories, search engines**
(a) return fewer hits (b) return better-sorted hits
(c) return hits that are reviewed by humans (d) return more hits.

## ANSWERS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.** | (a) | **2.** | (c) | **3.** | (d) | **4.** | (a) | **5.** | (b) | **6.** | (b) | **7.** | (d) | **8.** | (c) |
| **9.** | (b) | **10.** | (c) | **11.** | (b) | **12.** | (a) | **13.** | (c) | **14.** | (c) | **15.** | (a) | **16.** | (b) |
| **17.** | (d) | **18.** | (c) | **19.** | (c) | **20.** | (b) | **21.** | (b) | **22.** | (d) | **23.** | (a) | **24.** | (c) |
| **25.** | (c) | **26.** | (b) | **27.** | (a) | **28.** | (b) | **29.** | (d) | **30.** | (b) | **31.** | (a) | **32.** | (c) |
| **33.** | (b) | **34.** | (c) | **35.** | (a) | **36.** | (b) | **37.** | (d) | **38.** | (a) | **39.** | (d) | **40.** | (b) |
| **41.** | (a) | **42.** | (c) | **43.** | (c) | **44.** | (d) | **45.** | (b) | **46.** | (c) | **47.** | (a) | **48.** | (c) |
| **49.** | (a) | **50.** | (d) | **51.** | (b) | **52.** | (b) | **53.** | (d) | **54.** | (c) | **55.** | (c) | **56.** | (c) |
| **57.** | (b) | **58.** | (a) | **59.** | (d) | **60.** | (a) | **61.** | (c) | **62.** | (a) | **63.** | (b) | **64.** | (b) |
| **65.** | (a) | **66.** | (c) | **67.** | (c) | **68.** | (c) | **69.** | (d) | **70.** | (d). | | | | |



# Cyber Security

## Cyber Security Introduction

**Cyber Security Basics:** Cyber security is the most concerned matter as cyber threats and attacks are overgrowing. Attackers are now using more sophisticated techniques to target the systems. Individuals, small-scale businesses or large organization, are all being impacted. So, all these firms whether IT or non-IT firms have understood the importance of Cyber Security and focusing on adopting all possible measures to deal with cyber threats.

### What is cyber security?

"Cyber security is primarily about people, processes and technologies working together to encompass the full range of threat reduction, vulnerability reduction, deterrence, international engagement, incident response, resiliency and recovery policies and activities, including computer network operations, information assurance, law enforcement etc."

OR

Cyber security is the body of technologies, processes and practices designed to protect networks, computers, programs and data from attack, damage or unauthorized access.

1. The term cyber security refers to techniques and practices designed to protect digital data.

2. The data that is stored, transmitted or used on an information system.

### Why is cyber security important?

Listed below are the reasons why cyber security is so important in what's become a predominant digital world:

1. Cyber attacks can be extremely expensive for businesses to endure.

2. In addition to financial damage suffered by the business, a data breach can also inflict untold reputational damage.

3. Cyber-attacks these days are becoming progressively destructive. Cybercriminals are using more sophisticated ways to initiate cyber attacks.

4. Regulations such as GDPR are forcing organizations into taking better care of the personal data they hold.

5. Because of the above reasons, cyber security has become an important part of the business and the focus now is on developing appropriate response plans that minimize the damage in the event of a cyber attack. But an organization or an individual can develop a proper response plan only when he has a good grip on cyber security fundamentals.

## Cyber Security Fundamentals

**Confidentiality:** Confidentiality is about preventing the disclosure of data to unauthorized parties. It also means trying to keep the identity of authorized parties involved in sharing and holding data private and anonymous. Often confidentiality is compromised by cracking poorly encrypted data, Man-in-the-middle (MITM) attacks, disclosing sensitive data. Standard measures to establish confidentiality include:

**5. Bots:** A bot (short for "robot") is an automated process that interacts with other network services. Some bots program run automatically, while others only execute commands when they receive specific input. Common examples of bots program are the crawler, chatroom bots and malicious bots.

The 7 layers of cyber security should centre on the mission critical assets you are seeking to protect.

**1. Mission Critical Assets:** This is the data you need to protect.

**2. Data Security:** Data security controls protect the storage and transfer of data.

**3. Application Security:** Applications security controls protect access to an application, an application's access to your mission critical assets and the internal security of the application.

**4. Endpoint Security:** Endpoint security controls protect the connection between devices and the network.

**5. Network Security:** Network security controls protect an organization's network and prevent unauthorized access of the network.

**6. Perimeter Security:** Perimeter security controls include both the physical and digital security methodologies that protect the business overall.

**7. The Human Layer:** Humans are the weakest link in any cyber security posture. Human security controls include phishing simulations and access management controls that protect mission critical assets from a wide variety of human threats, including cyber criminals, malicious insiders, and negligent users.

**Cyber threats:** Cyber threats are security incidents or circumstances with the potential to have a negative outcome for your network or other data management systems.

Examples of common types of security threats include **phishing attacks** that result in the installation of **malware** that infects your data, failure of a staff member to follow data protection protocols that cause a **data breach** or even a tornado that takes down your company's data headquarters, disrupting access.

**Vulnerabilities:** Vulnerabilities are the gaps or weaknesses in a system that make threats possible and tempt threat actors to exploit them.

Types of vulnerabilities in network security include but are not limited to SQL injections, server misconfigurations, cross-site scripting and transmitting sensitive data in a non-encrypted plain text format.

When threat probability is multiplied by the potential loss that may result, cyber security experts, refer to this as a risk.

**Computer criminals:** Computer criminals have access to enormous amounts of hardware, software and data; they have the potential to cripple much of effective business and government throughout the world. In a sense, the purpose of computer security is to prevent these criminals from doing damage.

We say **computer crime** is any crime involving a computer or aided by the use of one. Although this definition is admittedly broad, it allows us to consider ways to protect ourselves, our businesses and our communities against those who use computers maliciously. One approach to prevention or moderation is to understand



who commits these crimes and why. Many studies have attempted to determine the characteristics of computer criminals. By studying those who have already used computers to commit crimes, we may be able in the future to spot likely criminals and prevent the crimes from occurring.

## Active Attacks

An active attack is a network exploit in which a hacker attempts to make changes to data on the target or data en route to the target.

### Types of Active Attacks

**1. Masquerade:** In this attack, the intruder pretends to be a particular user of a system to gain access or to gain greater privileges than they are authorized for. A masquerade may be attempted through the use of stolen login IDs and passwords, through finding security gaps in programs or through bypassing the authentication mechanism.

**2. Session replay:** In this type of attack, a hacker steals an authorized user's log in information by stealing the session ID. The intruder gains access and the ability to do anything the authorized user can do on the website.

**3. Message modification:** In this attack, an intruder alters packet header addresses to direct a message to a different destination or modify the data on a target machine.

**4.** In a **denial of service (DoS)** attack, users are deprived of access to a network or web resource. This is generally accomplished by overwhelming the target with more traffic than it can handle.

**5.** In a **Distributed Denial-of-Service (DDoS)** exploit, large numbers of compromised systems (sometimes called a botnet or zombie army) attack a single target.

## Passive Attacks

Passive attacks are relatively scarce from a classification perspective, but can be carried out with relative ease, particularly if the traffic is not encrypted.

### Types of Passive Attacks

**1. Eavesdropping (tapping):** The attacker simply listens to messages exchanged by two entities. For the attack to be useful, the traffic must not be encrypted. Any unencrypted information, such as a password sent in response to an HTTP request, may be retrieved by the attacker.

**2. Traffic analysis:** The attacker looks at the metadata transmitted in traffic in order to deduce information relating to the exchange and the participating entities, e.g. the form of the exchanged traffic (rate, duration etc.). In the cases where encrypted data are used, traffic analysis can also lead to attacks by cryptanalysis, whereby the attacker may obtain information or succeed in unencrypting the traffic.

**3. Software attacks:** Malicious code (sometimes called malware) is a type of software designed to take over or damage a computer user's operating system, without the user's knowledge or approval. It can be very difficult to remove and very damaging. Common malware examples are listed in the following table:

| Attack | Characteristics |
|---|---|
| Virus | A virus is a program that attempts to damage a computer system and replicate itself to other computer systems. A virus: |
| | 1. Requires a host to replicate and usually attaches itself to a host file or a hard drive sector. |
| | 2. Replicates each time the host is used. |
| | 3. Often focuses on destruction or corruption of data. |
| | 4. Usually attaches to files with execution capabilities such as .doc, .exe, and .bat extensions. |
| | 5. Often distributes *via* e-mail. Many viruses can e-mail themselves to everyone in your address book. |
| | Examples: Stoned, Michelangelo, Melissa, I Love You. |
| Worm | A worm is a self-replicating program that can be designed to do any number of things, such as delete files or send documents *via* e-mail. A worm can negatively impact network traffic just in the process of replicating itself. A worm: |
| | 1. Can install a backdoor in the infected computer. |
| | 2. Is usually introduced into the system through a vulnerability. |
| | 3. Infects one system and spreads to other systems on the network. |
| | Example: Code Red. |
| Trojan horse | A Trojan horse is a malicious program that is disguised as legitimate software. Discretionary environments are often more vulnerable and susceptible to Trojan horse attacks because security is user focused and user directed. Thus, the compromise of a user account could lead to the compromise of the entire environment. A Trojan horse: |
| | 1. Cannot replicate itself. |
| | 2. Often contains spying functions (such as a packet sniffer) or backdoor functions that allow a computer to be remotely controlled from the network. |
| | 3. Often is hidden in useful software such as screen savers or games. |
| | Example: Back Orifice, Net Bus, Whack-a-Mole. |
| Logic Bomb | A Logic Bomb is malware that lies dormant until triggered. A logic bomb is a specific example of an asynchronous attack. |
| | 1. A trigger activity may be a specific date and time, the launching of a specific program or the processing of a specific type of activity. |
| | 2. Logic bombs do not self-replicate. |
| | Example: Remove data, Distored data, Data theft. |

**3. What is the full form of CIA under information security?**
(a) Confidentiality Integrity Availability
(b) Criminal Investigation Agency
(c) Cost Information Agency
(d) Credit Integrity Assessment.

**4. What is called periodic assessment of security vulnerability in computer system?**
(a) Threat (b) Attack
(c) Hacking (d) Security audit.

**5. What is called a single point of access for several networking services?**
(a) Phishing (b) Web service
(c) Directory service (d) Worms.

**6. Which activities endanger the sovereignty and integrity of nation?**
(a) Cyber Terrorism (b) Cyber vandalism
(c) Cyber squatting (d) Carding.

**7. Which crime involves the use of computer networks to create, distribute or access materials that sexually expoit underage persons?**
(a) Assault by Threat (b) Cyber squatting
(c) Cyber vandalism (d) Child pornography.

**8. Which method go through all the files or network elements with an intention to detect something unusual?**
(a) Probing (b) Phishing
(c) Infecting (d) Scanning.

**9. Victims of cyber attack might loose ..... .**
(a) data (b) money
(c) both (a) and (b) (d) none of these.

**10. Under information security, any device having ..... is classified as a computing device.**
(a) processor (b) memory
(c) both (a) and (b) (d) neither (a) nor (b).

**11. Under information security, CIA stands for ..... .**
(a) Criminal Investigation Agency
(b) Confidentiality, Integrity, Availability
(c) Cost Information Agency
(d) Credit Integrity Assessment.

**12. Script files sent mostly through email attachment to attack host computer are called ..... .**
(a) Worms (b) Phishing attacks
(c) Trojan (d) Computer viruses.



**13. Attacking the victims through fake URL resembling that of a valid financial Institution is called ..... .**
(a) Worms (b) Phishing attack
(c) Trojan (d) Computer viruses.

**14. Getting the user ID and password from a victim through dubious program is called ..... attack.**
(a) Worms (b) Phishing attack
(c) Trojan (d) Computer viruses.

**15. A malicious program spreading through internet and storage media and attacking the data in victims computer is called ..... .**
(a) Worms (b) Phishing attack
(c) Trojan (d) Computer virus.

**16. Potential weaknesses in IT infrastructure through which a cyber attack might occur is called ..... .**
(a) strength (b) antivirus
(c) vulnerability (d) port.

**17. Vulnerability for cyber attack may be in ..... .**
(a) operating system (b) application software
(c) IT infrastructure (d) all of these.

**18. To protect the network infrastructure from vulnerability, ..... is setup.**
(a) firewall (b) Internet security software
(c) both (a) and (b) (d) none of these.

**19. The person using vulnerability in operating system or application software or IT infrastructure to intrude into the computer of a victim is called ..... .**
(a) hacker (b) cracker
(c) maker (d) taker.

**20. Periodic assessment of security vulnerability in computer systems is called ..... audit.**
(a) threat (b) attack
(c) hacking (d) security.

**21. The security audit team ..... to keep the computers safe from cyber attacks.**
(a) assesses vulnerability
(b) decides the safety measures through hardware and software
(c) considers latest threat scenario and implements information safety
(d) all of the above.

**22. To ensure information safety, ..... should be implemented.**
(a) physical access security (b) password access security
(c) secure IT infrastructure (d) all of these.

**23. A single point of access for several networking services is called ..... .**
(a) directory service
(b) web server
(c) e-mail server
(d) none of these.

**24. Directory service permits security administrators to ..... .**
(a) concentrate on security of directory service instead of individual machines
(b) create new vulnerabilities
(c) damage the security of computers
(d) create new virus.

**25. Directory service should be able to ..... in the infrastructure.**
(a) include new services
(b) easily search for information in the network
(c) the information stored on the directory server should be accessible from any operating system
(d) all of the above.

**26. Which of the following is not a factor in securing the environment against an attack on security?**
(a) The education of the attacker
(b) The system configuration
(c) The network architecture
(d) The business strategy of the company.

**27. Protecting access to a computer through ..... is called access control.**
(a) physical restriction of entry
(b) password security for login
(c) both (a) and (b)
(d) none of these.

**28. Security should be implemented at the stage of ..... in software.**
(a) development stage
(b) entire life cycle
(c) Sofware Development Life Cycle (SDLC)
(d) all of these.

**29. SDLC in software development stands for ..... .**
(a) Software Development Life Circus
(b) Software Development Life Cycle
(c) Software Drafting Life Cycle
(d) Software Development Lead Cycle.



**30. Protection from ..... of source code means non-disclosure of the source code to outsiders.**
(a) disclosure
(b) alteration
(c) destruction
(d) log of changes (who is making request).

**31. Protection from ..... of source code means allotting the right to edit the source code to authorized persons only.**
(a) disclosure
(b) alteration
(c) destruction
(d) log of changes (who is making request).

**32. Protection from ..... of source code means protection of any individual from destroying the software source code.**
(a) disclosure
(b) alteration
(c) destruction
(d) log of changes (who is making request).

**33. Protection from ..... of source code means recording all changes made to the source code and the person making such changes.**
(a) disclosure
(b) alteration
(c) destruction
(d) log of changes (who is making request).

**34. ..... of access rights in source code development means verification of role before permitting access to source code.**
(a) verification
(b) maintaining historical records
(c) error handling
(d) log of changes (who is making request).

**35. ..... in source code development means verification of role before permitting access to source code.**
(a) verification
(b) maintaining historical records
(c) error handling
(d) log of changes (who is making request).

**36. ..... in source code development means handling of configuration errors, session errors and exceptions.**
(a) verification
(b) maintaining historical records
(c) error handling
(d) log of changes (who is making request).

**37.** Protecting the data divulged by customers from unauthorized access is called ..... .
(a) privacy protection (b) audit
(c) antivirus (d) vulnerability.

**38.** Information on criminal records of individuals, financial data of companies, genetic information, address, mobile number, e-mail ID, record of web surfing behaviour, record of credit card, record of debit card, netbanking details etc. are classified under ..... .
(a) privacy protection (b) audit
(c) antivirus (d) vulnerability.

**39.** Information security audit may be conducted with reference to ..... .
(a) vulnerabilities (b) threats
(c) preventive measures (d) all of these.

**40.** Information security audit analyses events of past threats to formulate ..... .
(a) security measures (b) safe practices
(c) software protection (d) all of these.

**41.** Any single employee ..... hold all data needed for making a complete financial transaction.
(a) should not (b) should
(c) may (d) might.

**42.** IT audit of the firm should be conducted periodically, which may be every ..... .
(a) fortnight (b) month
(c) quarter (d) all of these.

**43.** IT act aims to ..... .
(a) protect victims of cyber fraud
(b) punish misbihavious involving technology
(c) both (a) and (b)
(d) none of the above.

**44.** Section ..... of IT Act imposes fine upto 2 Lakh and imprisonment upto 2 years for tampering with computer source documents.
(a) 65 (b) 66 (c) 66B (d) 66C.

**45.** Section ..... of IT Act imposes fine upto 5 Lakh and imprisonment upto 3 years for hacking.
(a) 65 (b) 66 (c) 66B (d) 66C.

**46.** Section ..... of IT Act imposes fine upto 1 Lakh and imprisonment up to 3 years for receiving stolen computer or mobile device.
(a) 65 (b) 66 (c) 66B (d) 66C.



**47.** Section ..... of IT Act imposes fine upto 1 Lakh and imprisonment upto 3 years for misuse of password.
(a) 65 (b) 66 (c) 66B (d) 66C.

**48.** Section ..... of IT Act imposes fine upto 1 Lakh and imprisonment upto 3 years for cheating with computer.
(a) 66D (b) 66E (c) 66F (d) 67.

**49.** Section of IT Act imposes fine upto 2 Lakh and imprisonment upto 3 years for publishing private images of others.
(a) 66D (b) 66E (c) 66F (d) 67.

**50.** Section ..... of IT Act imposes life imprisonment for cyber terrorism.
(a) 66D (b) 66E (c) 66F (d) 67.

**51.** Section ..... of IT Act imposes fine up to 1 Lakh and imprisonment upto 5 years for publishing obscene content.
(a) 66D (b) 66E (c) 66F (d) 67.

**52.** Section ..... of IT Act imposes fine up to 1 Lakh and imprisonment upto 7 years for publishing sexual content.
(a) 67A (b) 67B (c) 67C (d) 68.

**53.** Section ..... of IT Act imposes fine upto 1 Lakh and imprisonment upto 7 years for publishing child porn.
(a) 67A (b) 67B (c) 67C (d) 68.

**54.** Section ..... of IT Act imposes undefined fine amount and imprisonment upto 3 years for failure to maintain records by operator.
(a) 67A (b) 67B (c) 67C (d) 68.

**55.** Section ..... of IT Act imposes fine upto 2 Lakh and imprisonment upto 3 years for failure to comply with orders.
(a) 67A (b) 67B (c) 67C (d) 68.

**56.** Section ..... of IT Act imposes undefined fine amount and imprisonment upto 7 years for refusal to decrypt data.
(a) 69 (b) 70 (c) 67C (d) 68.

**57.** Section ..... of IT Act imposes fine up to 1 Lakh and imprisonment upto 3 years for disclosure of wrong information.
(a) 69 (b) 70 (c) 67C (d) 68.

**58.** Fine upto Rs. ..... may be imposed under sections 66B (receiving stolen mobile/computer), 66C (password misuse), 66D (cheating with computer), 67 (publishing obscene content), 67A (publishing sexual content), 67B (publishing child porn) and 70 (disclosure of wrong information) of the IT Act, 2000.
(a) 1 Lakh (b) 2 Lakh
(c) 5 Lakh (d) none of these.

**59.** Fine upto Rs. ..... may be imposed under sections 65 (tampering with computer), 66E (publishing private images of others) and 68 (failure to comply with orders) of the IT Act, 2000.
(a) 1 Lakh (b) 2 Lakh
(c) 5 Lakh (d) none of these.

**60.** Fine upto Rs. ..... may be imposed under section 66 (hacking) of the IT Act, 2000.
(a) 1 Lakh (b) 2 Lakh
(c) 5 Lakh (d) none of these.

**61.** Imprisonment up to ..... years may be imposed under section 65 (tampering with computer documents) of the IT Act, 2000.
(a) 2 (b) 3 (b) 5 (d) 7.

**62.** Imprisonment upto ..... years may be imposed under sections 66 (hacking), 66B (receiving stolen computer/mobile), 66C (misuse of password), 66D (cheating with computer), 66E (publishing private images of others), 67C (failure to maintain records by operator), 68 (failure to comply with orders) and 70 (disclosure of wrong information) of the IT Act, 2000.
(a) 2 (b) 3
(c) 5 (d) 7.

**63.** Imprisonment upto ..... years may be imposed under section 67 (publishing obscene content) of the IT Act, 2000.
(a) 2 (b) 3
(c) 5 (d) 7.

**64.** Imprisonment upto ..... years may be imposed under sections 67A (publishing sexual content) and 69 (refusal to decrypt data) of the IT Act, 2000.
(a) 2 (b) 3
(c) 5 (d) 7.

**65.** Imprisonment upto ..... years may be imposed under section 66F (cyber terrorism) of the IT Act, 2000.
(a) Life (b) 3
(c) 5 (d) 7.



**66.** ..... can keep unwanted ads to show up.
(a) Adware (b) Hardware
(c) Malware (d) Spyware.

**67.** ..... servers provides a central storeroom for storing and managing information.
(a) Clint (b) Directory
(c) Post (d) Group.

**68.** ..... generally refers to a system that can control, monitor and restrict the movement of people, assets or vehicles, in, out and around a building or site.
(a) Access control (b) Security Guard
(c) Form Denial (d) None of these.

**69.** Which chapter of the IT awareness Act talks about electronic governance?
(a) 4 (b) 3
(c) 2 (d) 1.

**70.** Chapter 7 of the IT awareness act deals with
(a) E-Commerce (b) Electronic Governance
(c) Digital Signature (d) None of these.

## Answers

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (b) | 2. | (c) | 3. | (a) | 4. | (d) | 5. | (c) | 6. | (a) | 7. | (d) | 8. | (d) | 9. | (c) | 10. | (c) |
| 11. | (b) | 12. | (a) | 13. | (b) | 14. | (c) | 15. | (d) | 16. | (c) | 17. | (d) | 18. | (c) | 19. | (a) | 20. | (d) |
| 21. | (d) | 22. | (d) | 23. | (a) | 24. | (a) | 25. | (d) | 26. | (d) | 27. | (c) | 28. | (d) | 29. | (b) | 30. | (a) |
| 31. | (b) | 32. | (c) | 33. | (d) | 34. | (a) | 35. | (b) | 36. | (c) | 37. | (a) | 38. | (a) | 39. | (d) | 40. | (d) |
| 41. | (a) | 42. | (d) | 43. | (c) | 44. | (a) | 45. | (b) | 46. | (c) | 47. | (d) | 48. | (a) | 49. | (b) | 50. | (c) |
| 51. | (d) | 52. | (a) | 53. | (b) | 54. | (c) | 55. | (d) | 56. | (a) | 57. | (b) | 58. | (a) | 59. | (b) | 60. | (c) |
| 61. | (a) | 62. | (b) | 63. | (c) | 64. | (d) | 65. | (a) | 66. | (a) | 67. | (b) | 68. | (a) | 69. | (b) | 70. | (c). |