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Class : X (C.E.)

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## ►►SERIESCOMPLETION◀◀

Series completion problems deals with number's alphabets and both together. While attempting to solve the question, you have to check the pattern of the series. Series moves with certain mathematical operations. You have to check in the examination:

- (i) Find the missing term (s).
- (ii) Find the word term(s).

# NUMBER SERIES:

## (a) Some Important Patterns :

(i) a, a \$ d, a \$ 2d, a \$ 3d.....(Arithmetic Progression)

(ii) a, ak, ak<sup>2</sup>, ak<sup>3</sup>, .....(Geometric Progression)

(iii) A,  $\frac{a}{k}$ ,  $\frac{a}{k^2}$ ,  $\frac{a}{k^3}$  .....(Geometric Progression)

(iv) Series of prime number - i.e. 2,3,5,7,11 .....

(v) Series of composite numbers - i.e. 4,6,8,9,10,12.....

**Direction : (1 to 6) Find the missing numbers :**

**Ex.1** 16, 19, 22, 25, ?

**Sol.** As per series a, a + d, a + 2d,.....

$$a = 16$$

$$d = 3$$

$$a + 4d = 16 + 4 \times 3$$

**Ans.** 28

**Ex 2.** 4, 8, 16, ? 64

**Sol.** As per series a, ak, ak<sup>2</sup>, ak<sup>3</sup> .....

$$a = 4$$

$$l = 2$$

$$ak^2 = 4 \times 2^3$$

**Ans.** 32

**Ex 3.** 240, ?, 10, 40, 10, 2

**Sol.** The pattern is  $\times 1, \times \frac{1}{2} \times \frac{1}{3} \times \frac{1}{4} \times \frac{1}{5}$   
 $\therefore$  missing term =  $240 \times 1 = 240$

**Ans.** 240

## (b) Multiple Series :

A multiple series is a mixture of more than one series :

**Ex 4.** 1, 1, 4, 8, 9, ?, 16, 64

**Sol.** (i) 1, 4, 9, 16 [1<sup>2</sup>, 1<sup>3</sup>, 2<sup>2</sup>, 2<sup>3</sup>, 3<sup>2</sup>, 3<sup>3</sup> .....]  
 (ii) 1, 8, \_\_\_\_\_, 64 mixed combination

**Ans.** 27

**Ex 5.** 9, 166, 258, ?, 4912

**Sol.** Each number is in two parts. The first part is square of consecutive number 3,4, 5.....

(3) <sup>2</sup>	(4) <sup>2</sup>	(5) <sup>2</sup>	(6) <sup>2</sup>	(7) <sup>2</sup>
9	16	25	36	49
	4	6	10	12

4

6

8

10

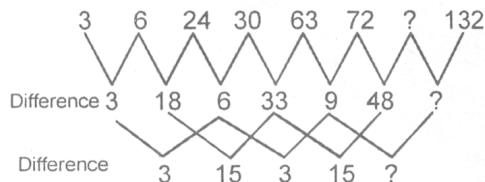
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The second part is the sequence of numbers with difference +2, like 4, 6, 8,.....  
Hence, the required number is 3610.

**Ans.** 3610

**Ex 6.** 3, 6, 24, 30, 63, 72, ?, 132

**Sol.** The difference between the terms is given below as :

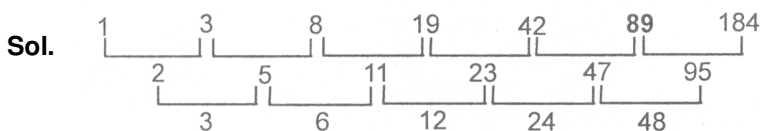


Therefore, alternate difference between the difference is 3 and 15 respectively.  
Hence, the next term would be  $72 + 48 = 120$ .

**Ans.** 120

**Directions : (7 to 8) Find the wrong term(s) -**

**Ex 7.** 1, 3, 8, 19, 42, 88, 184



Hence, number 88 is wrong and should be replaced by 89.  
or  $1 \times 2 + 1, 3 \times 2 + 2, 8 \times 2 + 3, 19 \times 2 + 4, 42 \times 2 + 5, 89 \times 2 + 6$

**Ans.** 88

**Ex 8.** 105, 85, 60, 30, 0, - 45, - 90

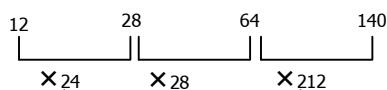
**Sol.**  $105 - 20 = 85$   
 $85 - 25 = 60$   
 $60 - 30 = 30$   
 $30 - 35 = -5$   
 $-5 - 40 = -45$   
 $-45 - 45 = -90$

Hence, number 0 is wrong and should be replaced by -5.

**Ans.** 0

**Direction : (9 to 10) In each of following questions, a number series is given. After the series, below it in the next line, a number is given followed by (P), (Q), (R) (S) and (T). You have to complete the series starting with the number given following the sequence of the given series. Then answer the question given below it.**

**Ex 9.** 12      28      64      140  
 37      (P)      (Q)      (R)      (S)      (R)  
 Which number will come in place of (T) ?



**Sol.**

Similarly	(P)	(Q)	(R)	(S)	(T)
37	78	164	340	696	1412
$\times 24$	$\times 28$	$\times 212$	$\times 216$	$\times 220$	

Therefore, the number 1412 will come in place of (E).

Ans. 1412

Ex 10. 2 9 57 337

3 (P) (Q) (R) (S) (T)

Which number will come in place of (Q) ?

Sol.

2	9	57	337
$\times 8.7$	$\times 7.6$	$\times 6.5$	

Similarly,	(P)	(Q)	(R)	(S)
3	17	113	673	3361
$\times 8.7$	$\times 7.6$	$\times 6.5$	$\times 5.4$	

Therefore, the number 113 will come in place of (Q).

Ans. 113

#### ALPHABET SERIES (SERIES OF LETTERS):

(a) Pattern of Alphabets Show Variation Based on :

- (i) Position of the letters
- (ii) Difference between the alphabets

(i) Position of alphabets:

Alphabets in order :

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
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Alphabets in reverse order :

Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Direction : (11 to 18) Find the missing term(s) :

Ex 11. B, E, H, ?



**Sol.** In the given series, every letter is moved three steps forward to obtain the corresponding letters of the next term. So, the missing term is K.

**Ex.12** Q, N, K, ?, E

**Sol/** In the given series, every letter is moved three steps backward to obtain the corresponding letters of the next term. So, the missing term is H.

**Ex. 13** CG, DI, ?, IP, MU

**Sol.** The first letter of the first, second, third,.....terms are moved one, two three, four, five,..... steps forward respectively and the second letters are moved two, three four, five, .....steps forward respectively. So the missing term would be FL.

**Ex.14.** AB, BA, ABD, DBA, PQRS, ?

**Sol.** The first term is reversed to get second term. The third term is reversed to get the fourth term. Similarly, to get the sixth term, we reverse the fifth term. So, the missing term would be SRQP.

**Ex.15.** 1725, 15X4, 13V3, ?, 9R1

**Sol.** The first number & second letter of every term is moves steps backward & the third number of every term is moved one step backward. So, the missing term would be 11T2.

**Ex.16.** FLP, INS, LPV, ?

**Sol.** First and third letters are moved three steps forward in each term & second letter is moved two steps forward in each term. So, the missing term would be ORY.

**Ex. 17.** D-4, F-6, H-8, J-10, ?

**Sol.** First letter and second number is moved two placed in each term. So, the missing term would be L - 12.

**Ex 18.** (ABC) - 6, (DEF) - 15, (GHI) - 24 ?

**Sol.** In given series

Let A = 1, B = 2, C = 3, D = 4, E = 5, F = 6 and so on

$$\left( \begin{matrix} A \\ 1 \end{matrix} + \begin{matrix} B \\ 2 \end{matrix} + \begin{matrix} C \\ 3 \end{matrix} \right) = 6 \quad \left( \begin{matrix} D \\ 4 \end{matrix} + \begin{matrix} E \\ 5 \end{matrix} + \begin{matrix} F \\ 6 \end{matrix} \right) = 15, \quad \left( \begin{matrix} G \\ 7 \end{matrix} + \begin{matrix} H \\ 8 \end{matrix} + \begin{matrix} I \\ 9 \end{matrix} \right) = 24$$

$$\text{So, the missing term would be } \left( \begin{matrix} J \\ 10 \end{matrix} + \begin{matrix} K \\ 11 \end{matrix} + \begin{matrix} L \\ 12 \end{matrix} \right) = 33$$

**Ans.** (JKL) - 33

**Directions : (19 to 22) Find the wrong term (s):**

**Ex 19.** G4T, J10R, M20P, P43N, S90L

**Sol.** First letter of every term is moved three steps forward in each next term. Second number of every term of the pattern  $\Rightarrow \times 2 + 1, \times 2 + 2, \times 2 + 3, \dots$  and third letter of every term is moved two steps backward. Hence, J10R is the wrong term and should be replaced by J9R.

**Ex. 20** ABD, DGK, HMS, NTB, SBL, ZKW

**Sol.** First letter of first, second, third ..... terms is moved three, four, five, .... steps forward respectively. Similarly, second letter is moved four, five, six, seven, ..... steps forward respectively and third letter is moved

seven, eight, nine,..... steps forward respectively. Hence, NTB is the wrong term and should be replaced by MTB.

**Ex 21.** EPV, FQW, GRX, HTY, ITZ

**Sol.** In every term, first second and third letter is in alphabetical order to its next term respectively. Fourth term is not following the same rule. Hence, HTY is the wrong term and should be replaced by HSY.

**Ex 22.** PON, RQP, TSR, VVT, XWV, ZYX

**Sol.** In every term, first second and third letter is moved two steps forward to its next term respectively. Fourth term is not following the same rule. Hence, VVT is the wrong term and should be replaced by VUT.

### LETTER REPEATING SERIES :

Pattern of such questions is that some letters in sequence are missing.

(i) The letter may be in cyclic order (clockwise or anti-clockwise).

(ii) To solve a problem, we have to select one of the alternatives from the given alternatives. The alternative which gives a sequence form of letters is the choice.

**Direction : (23 to 28) Find the missing term(s) :**

**Ex 23** a s\_b a a)B b b\_a

- (A) baa (B) abb (C) bab (D) aab

**Sol.** we proceed step by step to solve the above series :

**Steps :**

1. The first blank space should be filled in by 'b' so that we have to a's followed by two b's
2. Second blank space should be filled in by 'a' so that we have three a's followed by three b's
3. The last blank space must be filled in by 'a' to keep the series in sequence

**Ans.** (A) baa

**Ex.24** \_bca\_ca\_c\_b\_

- (A) aabbc (B) abbbc (C) aabcc (D) abbac

**Sol.**



Series is abc/abc/abc/abc. So, pattern abc is repeated.

**Ans.** (D) abbac

**Ex.25** a\_abb\_aa\_ba\_a\_b

- (A) ababa (B) aabba (C) aabab (D) aaabb

**Sol.** Series is aaabb/aaabb/aaabb. So, pattern aaabb is repeated.

**Ans.** (C) aabab

**Ex.26** a\_c\_abb\_ca\_a

- (A) baca (B) bbca (C) bacc (D) bacb

**Sol.** Series is abc/aabbcc/aaa

**Ans.** (A) baba

**Ex.27** a \_bc\_a \_bcd\_a \_ccd\_bcd\_

(A) abdbdbd (B) acbdbb (C) adbbad (D) bbbbbb

**Sol.** Series is aabcd/abbcd/abccd/abcdd

**Ans.** (C) adbbad

**Ex.28** cc\_ccdd\_d\_cc\_ccdd\_dd

(A) dcdcc (B) dcddc (C) dccdd (D) None of these

**Sol.** Series is ccdcc/ddcdd/ccdcc/ddcdd

**Ans.** (B) dcddb

**Direction : (29)** The question given below is based on the letter series, In series, some letter are missing. Select the correct alternative. If more than five letter are missing, select the last five letters of the series.

**Ex.29** xyzu\_yz\_v\_\_uv\_\_\_\_\_

(A) uvxyz (B) vuzyx (C) uvzyx (D) vuxyz

**Sol.** The series is x y z u v / y z u v x / z u v x y / u v x y z  
 Thus the letters are written in a cyclic order.

**Ans.** (A) uvxyz

**Direction : (30)** There is a letter series in the first row and a number series in the second row. Each number in the number series stands for a letter in the letter series. Since in each of that series some term are missing you have to find out as to what those terms are, and answer the questions based on these as given below in the series.

**Ex.30** a \_h\_\_c\_n\_e\_h\_e a c \_ \_ \_ \_ \_

2 1\_4 3\_5\_\_2 5 4 \_ \_ \_ \_ \_

The last five terms in the series are

(A) 32524 (B) 43215 (C) 25314 (D) 32541

**Sol.** By taking a = 2, c = 1, n = 4, h = 5 and e = 3, the numbers series runs as 21543 15432 54321 43215. If first digit of a group of five digits is placed as the last digit, we obtain the second group of five digits and so on.

**Ans.** (B) 43215

**Direction : (31)** In the following question, three sequences of letter/number are given which correspond to each other in some way. In the given question, you have to find out the letter/numerals that come in the vacant places marked by (?). These are given as one of the four alternatives under the question. Mark your answer as instructed.

**Ex.31** C B \_ \_ D \_ B A B C C B

\_ \_ 2 3 5 4 \_ \_ ? ? ? ?

p \_ p q \_ r \_ q \_ \_ \_ \_

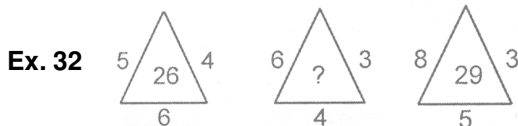
(A) 4 5 5 4 (B) 4 3 3 4 (C) 4 2 2 4 (D) 2 5 5 2

**Sol.** Comparing the positions of the capital letters, numbers and small letters, we find p corresponds to C and 2 corresponds to p. So, p and 2 correspond to C. q corresponds to A and 3 corresponds to q. So, q and 3 corresponds to A. Also, 5 corresponds to D. So, the remaining number i.e., 4 corresponds to B. So, BCCB corresponds to 4, 2, 2, 4.

**Ans.** (C) 4224

### MISSING TERMS IN FIGURES :

**Directions : (32 to 40) Find the missing number(s) :**



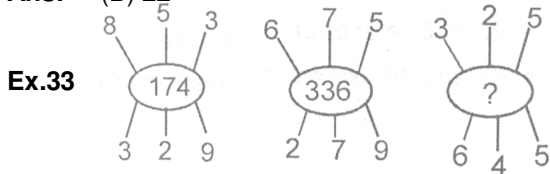
- (A) 32 (B) 22 (C) 18 (D) 27

**Sol.** In first figure,  $5 \times 4 + 6 = 26$

In second figure,  $8 \times 3 + 5 = 29$

$\therefore$  missing number in third figure,  $6 \times 3 + 4 = 22$

**Ans.** (B) 22



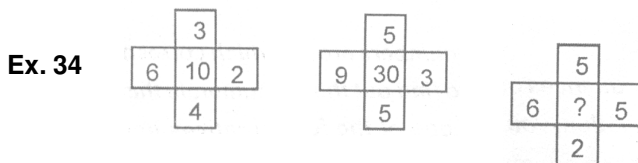
- (A) 140 (B) 150 (C) 200 (D) 180

**Sol.** In first figure,  $8 \times 5 \times 3 + 3 \times 2 \times 9 = 120 + 54 = 170$

In second figure,  $6 \times 7 \times 5 + 2 \times 7 \times 9 = 210 + 126 = 336$

$\therefore$  missing number in third figure,  $3 \times 2 \times 5 + 6 \times 4 \times 5 = 30 + 120 = 150$

**Ans.** (B) 150



- (A) 15 (B) 20 (C) 25 (D) 40

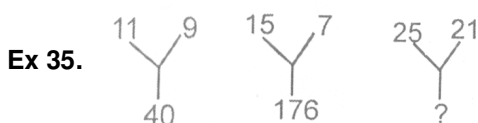
**Sol.** Clearly

In first figure,  $6 \times 3 - 4 \times 2 = 18 - 8 = 10$

In second figure,  $9 \times 5 - 5 \times 3 = 45 - 15 = 30$

$\therefore$  In third figure,  $6 \times 5 - 2 \times 5 = 30 - 10 = 20$

**Ans.** (B) 20



- (A) 184 (B) 210 (C) 241 (D) 425

**Sol.** The number at the bottom is the difference of squares of two numbers given at top  
 In first,  $11^2 - 9^2 = 121 - 81 = 40$   
 In second figure,  $15^2 - 7^2 = 225 - 49 = 176$   
 $\therefore$  In third figure,  $25^2 - 21^2 = 625 - 441 = 184$

**Ans.** (A) 184

**Ex. 36**

6	18	15
3	2	5
4	3	?
8	27	9

- (A) 11 (B) 6 (C) 3 (D) 2

**Sol.** Clearly, in the I Column,  $\frac{6 \times 4}{3} = 8$

In the II column,  $\frac{18 \times 3}{2} = 27$

We take x in place of ?

Similarly I the III column,  $\frac{15 \times x}{5} = 9$

$$x = \frac{9 \times 5}{15} = 3$$

**Ans.** (C) 3

**Ex. 37**

1	4
7	
5	3

3	4
6	
2	3

2	0
?	
1	3

- (A) 0 (B) 2 (C) 3 (D) 1

**Sol.**  $(4 \times 3) - (5 \times 1) = 7$ ,  $(4 \times 3) - (2 \times 3) = 6$   
 Similarly,  $(2 \times 1) - (3 \times 0) = 2$

**Ans.** (B) 2

**Ex. 38**

9
5-8-3
7

5
4-7-0
6

10
7-?-5
3

- (A) 12 (B) 9 (C) 14 (D) 10

**Sol.** In the Diagram,  $(9 - 3) + (7 - 5) = 8$   
 In the II Diagram,  $(6 - 4) + (5 - 0) = 7$

∴ In the III Diagram,  $(10 - 5) + (7 - 3) = 9$

Ans. (B) 9

Ex. 39 Find the missing letters from left to right.

Z	-	V
R	K	-
-	C	F

(A) JSN

(B) JNS

(C) JRS

(D) KRS

Sol. In first column,  $Z = 26$ ,  $R = 18$   
In second column,  $K = 11$ ,  $C = 3$   
We find the gap of 8 is there both columns.  
adopting the same rule, we find that

Ans.

Ex 40.

3	8	10	2	?	1
6	56	90	2	20	0

$V = 22$ ,  $N = 14$

(A) JSN

(A) 0

(B) 3

(C) 5

(D) 7

Sol. Suppose X denotes the numbers in the first row and Y denotes the numbers in the second row.

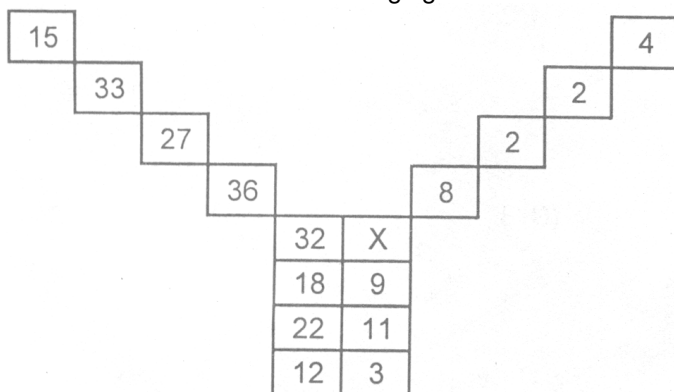
Then, the pattern is  $X^2 - X = Y$ .

Clearly,  $3^2 - 3 = 9 - 3$ ;  $8^2 - 8 = 64 - 8 = 56$ ;  $10^2 - 10 = 100 - 10 = 90$ ;  $2^2 - 2 = 4 - 2 = 2$ ;  $1^2 - 1 = 1 - 1 = 0$ .

Similarly,  $5^2 - 5 = 20$ . So, the missing number is 5.

Ans. (C) 5

Ex. 41 Find the value of X in the following figure :



(A) 3

(B) 4

(C) 8

(D) 12

Sol. The top left number is obtained by adding the bottom two numbers. The top right hand number is the result of dividing the bottom two numbers. Thus,  
 $12 + 3 = 15$ ,  $12 \div 3 = 4$ ;  
 $22 + 11 = 33$ ,  $22 \div 11 = 2$ ;

$18 + 9 = 27$ ,  $18 \div 9 = 2$ .

So,  $32 + X = 36$  and  $32 \div X = 8$  or  $X = 4$ .

Ans. (B) 4

## PRACTICE EXERCISE

**Directions : (1 to 5) Find the missing numbers :**

1. 2, 8, 18, 32, ?  
 (A) 62 (B) 60 (C) 50 (D) 46
2. 16, 54, 195, ?  
 (A) 780 (B) 802 (C) 816 (D) 824
3. 14, 316, 536, 764, ?  
 (A) 981 (B) 1048 (C) 8110 (D) 9100
4. 8, 11, 15, 22, 33, 51, ?, 127, 203  
 (A) 80 (B) 53 (C) 58 (D) 69
5. 2, 3, 6, 18, ?, 1944  
 (A) 154 (B) 180 (C) 108 (D) 452
6. 7, 19, 55, 163, ?  
 (A) 387 (B) 329 (C) 527 (D) 487
7. 1, 2, 9, 4, 25, 6, ?  
 (A) 51 (B) 49 (C) 50 (D) 47
8. 16, 33, 67, 135, ?  
 (A) 371 (B) 175 (C) 271 (D) 287
9. 8, 24, 16, ?, 7, 14, 6, 18, 12, 5, 5, 10  
 (A) 14 (B) 10 (C) 7 (D) 5
10. 2, 12, 36, 80, 150, ?  
 (A) 194 (B) 210 (C) 252 (D) 258

**Directions : (11 to 13) In each of the following questions, a number series is given. After series, below it in the next line, a number is given followed by (P), (Q), (R), (S) and (T). You have to complete the series starting with the number given following the sequence of the given series. Then answer the question given below it.**

11. 2      3      8      27  
 5      (P)      (Q)      (R)      (S)      (T)  
 Which of the following numbers will come in place of (T) ?  
 (A) 184 (B) 6 (C) 925 (D) 45
12. 5      18      48      112  
 7      (P)      (Q)      (R)      (S)      (T)  
 Which number will come in place of (S) ?  
 (A) 172 (B) 276 (C) 270 (D) 376
13. 15      159      259      323  
 7      (P)      (Q)      (R)      (S)      (T)

Which of the following numbers will come in place of (R) ?

- (A) 251 (B) 315 (C) 176 (D) 151

**Direction : (14 to 15) Find the wrong term(s) -**

14. 9, 11, 15, 23, 39, 70, 135  
(A) 23 (B) 39 (C) 70 (D) 135
15. 3, 9, 36, 72, 216, 864, 1728, 3468  
(A) 3468 (B) 1728 (C) 864 (D) 216

**Directions : (16 to 25) Find the missing term(s) :**

16. DFK, FEL, HDM, JCN, ?  
(A) KBN (B) KBO (C) LBO (D) LBN
17. JXG, HTJ, FPN, ?, BHY  
(A) EKS (B) ELS (C) DRL (D) DLS
18. B2E, D5H, F12K, H27M, ?  
(A) J58Q (B) J56Q (C) J57Q (D) J56P
19. CYD, FTH, IOL, LJP, ?  
(A) PET (B) OET (C) OEY (D) PEV
20. ZGL, XHN, VIQ, TJU, ?  
(A) RKX (B) RKY (C) RLZ (D) RKZ
21. 2B, 4C, 8E, 14H, ?  
(A) 22L (B) 24L (C) 22K (D) 2 M
22. MTH, QRK, UPN, YNQ, ?  
(A) CKT (B) CLT (C) ELT (D) EKT
23. B3M, E7J, H15G, K31D, ?  
(A) N65A (B) O63A (C) N63A (D) N63Z
24. 5X9, X8U12, 11R15, 14O18, ?  
(A) 17L21 (B) 17K21 (C) 17M21 (D) 17L23
25. 6C7, 8F10, 11J14, 15O19, ?  
(A) 19U24 (B) 20U25 (C) 19U25 (D) 20U24

**Direction : (26 to 29) Find the wrong term(s) :**

26. ECA, JHF, OMK, TQP, YWU  
(A) ECA (B) JHF (C) TQP (D) YWU
27. DKY, FJW, HIT, JHS, LGQ  
(A) FJW (B) LGQ (C) JHJ (D) HIT
28. DVG, FSI, HPK, JNM, LJO  
(A) DVG (B) JNM (C) HPK (D) LJO
29. CDF, DEG, EFH, FHI  
(A) CDF (B) DEG (C) FHI (D) EFH



30. ZLA, BMY, CNW, FOU, HPS  
(A) ZLA (B) BMY (C) FOU (D) CNW

**Directions : (31 to 38) Which sequence of letter when placed at the blanks one after the other will complete the given letter series ?**

31. a \_ b a a \_ a a \_ a b  
(A) a a a a (B) b a a a (C) b b a a (D) a b b a
32. \_ a a b b \_ a \_ b \_ b  
(A) b b a a (B) b a b a (C) b a ab (D) a b a b
33. a a b \_ a a a \_ b b a \_  
(A) b a a (B) a b b (C) b a b (D) a a b
34. a \_ \_ b \_ a \_ a b \_ a a  
(A) a b a a b (B) b b a b a (C) b b a b b (D) b a a b a
35. abc \_ d \_ bc \_ d \_ db \_ cda  
(A) bacdc (B) cdabc (C) dacab (D) dccbd
36. a \_ bbc \_ aab \_ cca \_ bbcc  
(A) bacb (B) acba (C) abba (D) caba
37. \_ b c \_ \_ b b \_ a a b c  
(A) acac (B) babc (C) abab (D) aacc
38. \_ b c c \_ ac \_ a a b b \_ a b \_ c c  
(A) aabca (B) abaca (C) bacab (D) bcaca

**Directions: (39 to 40) The questions given below are based on the letter, series, In each of these series, some letters are missing. Select the correct alternative. If some than five letters are missing, select the last five letters of the series.**

39. \_ \_ r \_ t p \_ \_ s \_ t p \_ \_ \_ s \_ \_ \_  
(A) rstqp (B) tsrqp (C) rstpq (D) None
40. \_ \_ x \_ z b x a z y x a b y z \_ \_ \_ \_ \_  
(A) abxzy (B) abzxy (C) abxyz (D) bxayz

**Directions : (41 to 42) There is a letter series in the first row and a number series in the second row. Each number in the number series stands for a letter in the letter. Since in each of that series some term are missing you have to find out as to what those terms are, and answer the questions based on these as given below in the series.**

41. a b \_ c d \_ a \_ a b d \_ d b a \_  
1 \_ 3 \_ 3 2 1 \_ \_ 4 \_ \_ \_  
The last four terms in the series are  
(A) 1234 (B) 3112 (C) 3211 (D) 4312
42. - b n t \_ \_ n a m \_ n a b \_ \_ a \_ \_ \_ \_  
1 3 \_ 2 5 3 \_ \_ 5 2 4 \_ 3 2 5 \_ \_ \_ \_  
The last five terms in the series are  
(A) 13425 (B) 41325 (C) 34125 (D) 13452

**Directions : (43 to 45) In each of the following questions, there sequences of letter. numbers are given which correspond to each other in some way. In each question, you have to find out the letter/numerals that come in the vacant places marked by (?). These are given as one of the four alternatives under the question. Mark your answer as instructed.**

43. \_ A C \_ B D \_ C D C D  
2 \_ 4 1 \_ 1 4 \_ \_ \_ \_  
r s \_ q r \_ p \_ ? \_ ? \_ ? \_  
(A) p q p q (B) p r p r (C) r q r q (D) r s r s
44. A \_ B A C \_ D \_ B C D C  
\_ 4 \_ 3 \_ 2 \_ 5 \_ ? \_ ? \_ ? \_ ? \_

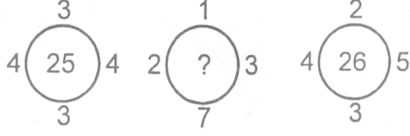
45. d C \_ \_ b a c b \_ \_ \_ \_  
 (A) 2 4 5 4 (B) 2 5 4 5 (C) 3 4 5 4 (D) 4 5 2 5  
 \_ A D A C B \_ \_ B D C C  
 2 4 \_ \_ 2 3 5 3 \_ \_ \_ \_  
 p \_ \_ q \_ \_ r s ? ? ? ?  
 (A) p r s s (B) p s r r (C) r p s s (D) s r p p

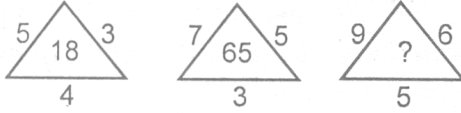
**Directions : (46 to 50) Find the missing term in the given figures**

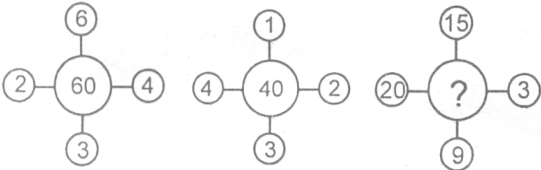
46. 

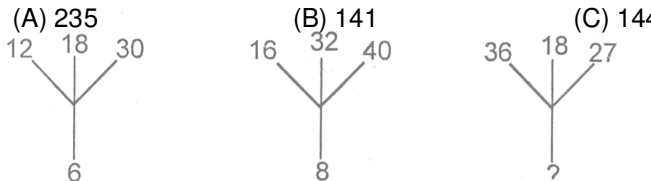
17	11	19
12	13	16
25	4	?

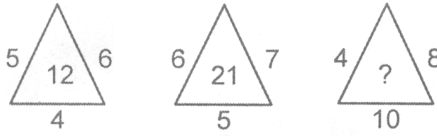
 (A) 36 (B) 9 (C) 25 (D) 64

47.   
 (A) 14 (B) 18 (C) 11 (D) 13

48.   
 (A) 112 (B) 92 (C) 82 (D) 102

49.   
 (A) 235 (B) 141 (C) 144 (D) 188

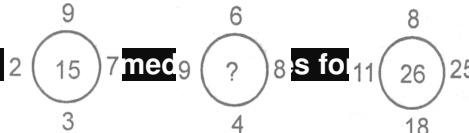
50.   
 (A) 18 (B) 12 (C) 9 (D) 6

51.   
 (A) 14 (B) 22 (C) 32 (D) 320

52. 

5	9	8
5	15	?
3	5	6

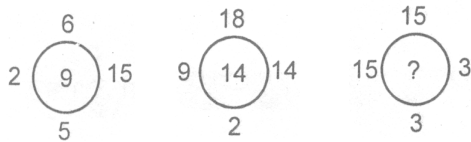
 (A) 12 (B) 11 (C) 16 (D) 26

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53.

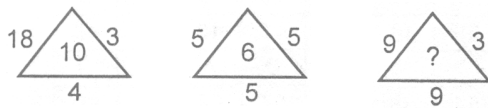
- (A) 72 (B) 18 (C) 9 (D) 19

54.



- (A) 1 (B) 18 (C) 90 (D) 225

55.



- (A) 20 (B) 22 (C) 24 (D) 12

56.

7	11	49
12	8	54
15	4	?

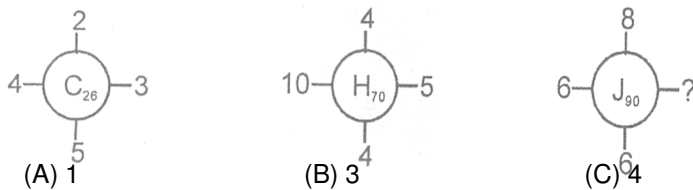
- (A) 36 (B) 7 (C) 25 (D) 0

57.

7	11	49
12	8	54
15	4	?

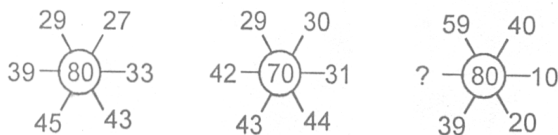
- (A) 2 (B) 3 (C) 4 (D) 5

58.



- (A) 1 (B) 3 (C) 4 (D) 5

59.



- (A) 69 (B) 49 (C) 50 (D) 60

60.



- (A) 127 (B) 142 (C) 158 (D) 198

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	C	D	D	A	C	D	B	C	C	C	C	B	B	C	A
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	C	D	A	B	D	A	C	C	A	B	C	D	B	C	D
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	D	D	A	A	C	B	A	C	C	A	C	D	A	B	D
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	B	D	B	D	C	C	C	D	A	D	D	B	C	A	B



# ➤ CODING– ECODING ◀

## CODING DECODING :

**Coding** is a method of sending a message to the receiver, such that the third person doesn't know about it. Code language is formed by certain rules & patterns. To know this language following certain rules is called 'Decoding'.

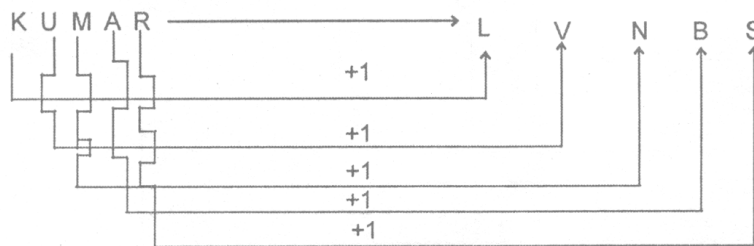
## TYPES OF CODING - DECODING :

- |   |  |
|---|--|
| (i) Letter - letter coding                | (ii) Letter - number coding              |
| (iii) To code letter/words in puzzle form | (iv) To code some objects in puzzle form |
| (v) To code as per table form/column form |  |

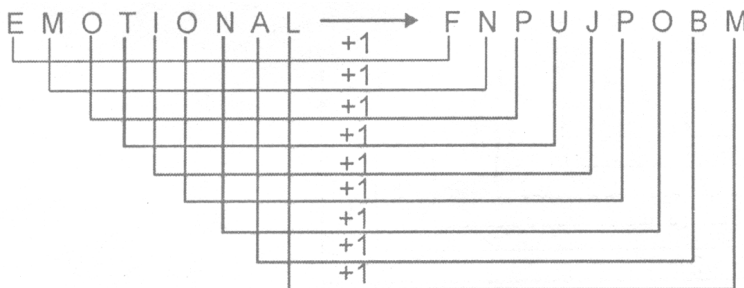
**Ex 1.** If in any code language, **KUMAR** is coded as **LVNBS**, How is **EMOTIONAL** coded in that language.

- (A) FNQUJQBM (B) FNPUJPOBM (C) GNPUNPOBM (D) GNQUJQOBM

**Sol.**



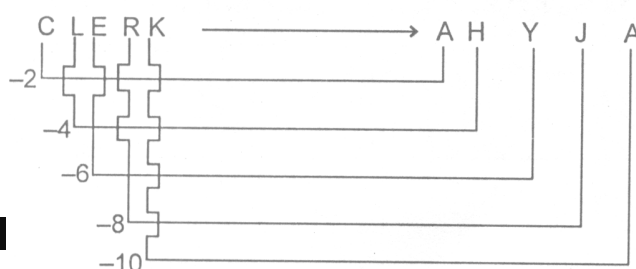
Similarly



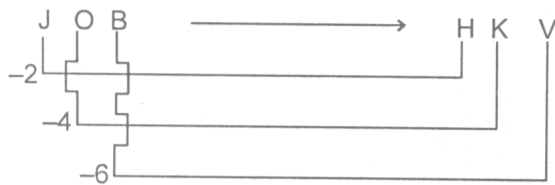
**Ans. (B)**

**Ex 2.** If in any code language **CLERK** is coded as **AHYJA** how is **JOB** coded in that language.

- (A) HKW (B) HKV (C) HKU (D) None



Similarly,



Ans. (B)

**Note :** The sum of a alphabet in order & in reverse order is **27** as explained below -

**Ex. 3.** If in any code language **NATIONAL** is written as **MZGRLMZO** than how is **JAIPUR** written in that language.

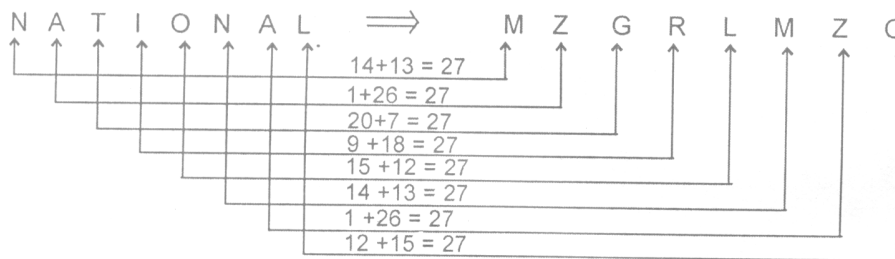
(A) QZRKFI

(B) PZRKFI

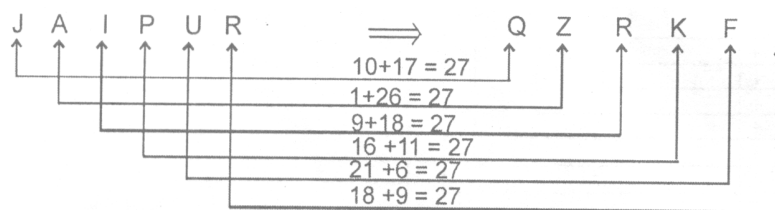
(C) QZRIFK

(D) QARKFI

**Sol.**



Similarly,



Ans. (A)

**Ex 4.** If the code for **ALLOWANCE** is **ZNKPVBMDD**, the word **DEARNESS** would be coded as :

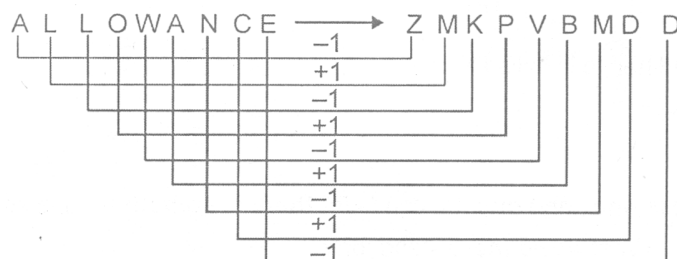
(A) CFBAODTR

(B) EDZQMFRT

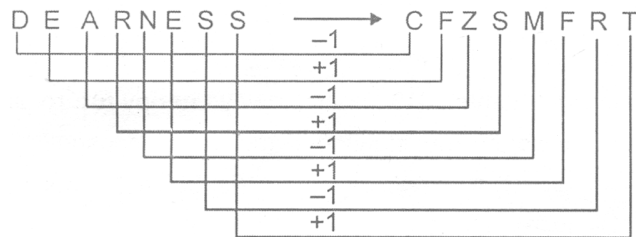
(C) CDZTMFTR

(D) CFZSMFRT

**Sol.**



Similarly,



Ans. (D)

Ex 5. If **RAT** = 42 and **CAT** = 57, then **LATE** = ?

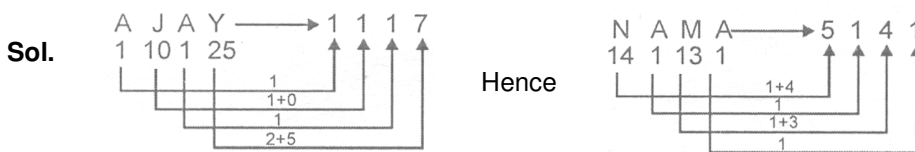
- (A) 60 (B) 70 (C) 64 (D) 74

Sol. In the given code Z = 1, Y = 2, X = 3, ....., C = 24, B = 25, A = 26.  
 So, RAT = 9 + 26 + 7 = 42 and CAT = 24 + 26 + 7 = 57  
 Similarly, LATE = 15 + 26 + 7 + 22 = 70

Ans. (B)

Ex 6. If **AJAY** is written as **1117**, then is same code **NAMA** would be written as

- (A) 5114 (B) 5411 (C) 5141 (D) 4511



Ans. (C)

Ex 7. In certain language, if **1** is coded as **A**, **2** as **B**, **3** as **C**, and so on, how is **FLOWER** coded in that code ?  
 (A) 6121523518 (B) 6121823515 (C) 6211523518 (D) 6218123515

Sol. In the given code 1 = A, 2 = B, 3 = C, ....., 24 = X, 25 = Y, 26 = Z  
 So, in FLOWER, F is coded as 6, L as 12, O as 15, W as 23, E as 5 and R as 18.

Ans. (A)

Ex 8. If the animals which can walk are called **swimmers**, animals which can crawl are called **flying**, those which live in water are called **snakes**, and those which fly in the sky are called **hunters**, then what will a **lizard** be called ?

- (A) Swimmer (B) Snake (C) Hunter (D) Flying

Sol. A lizard is an animal which crawls and hence is called 'flying'.

Ans. (D)

**Ex 9.** If **knr lin hcn** stands for **everything is fine** ; **nso one lin** stands for **there is something** and **ksa nso wno** stands for **ask something now** ; What would **there** stand for ?

(A) lin

(B) nso

(C) ons

(D) kse

**Sol.** **lin** is common in first two sentences, it stands for **is** **nso** is common in last two sentences, it stands for **something**. Clearly, in second statement **there** stands for **ons**.

Ans. (C)

**Ex 10.** In a code language **157** means **mother always lovable**, **619** means **always happy future** and **952** means **mother very happy** then what does the word **future** stand for in the same language ?

(A) 9

(B) 6

(C) 1

(D) Can not be determined

**Sol.** 157 means mother always lovable .....(i)

619 means always happy future .....(ii)

952 means mother very happy .....(iii)

from (i) & (ii) **always** means **1**

from (i) & (iii) **happy** means **9**

So, **future** means **6**

Ans. (B)

**Directions : (11 to 14) Column I contains five capital letters while column II contains five digits. Each letter corresponds to a single digit but not necessarily in that order.**

Column-I	Column-II
BEIKL	61520
PNBTK	34568
XLPBE	57401
KNIXV	27396
XBNPE	45713

**Ex 11.** What is the value of **BIKE** ?

(A) 5261

(B) 6125

(C) 2560

(D) None of these

**Ex 12.** What is the value **PIN + NIP** ?

(A) 423

(B) 744

(C) 777

(D) 747

**Ex 13.** What is the value of **BITE - KITE** ?

(A) 386

(B) 1000

(C) -1000

(D) None of these

**Ex 14.** What is value of **NIL + NINE - TEN** ?

(A) 4364

(B) 2738

(C) 2097

(D) None of these

**Sol. (11 to 14) :**

A digit will be the code of letter if both are present in the same rows and also absent in the same rows.



So, Code of B is 5 as both are present in row no. (i), (ii), (iii), (v) & absent in row no. (iv).  
 Code of E is 1 as both are present in row no. (i) (iii), (v) & absent in row no. (ii), (iv)  
 Code of I is 2 as both are present in row no. (i) (iv) & absent in row no. (ii), (iii), (v).  
 Code of L is 0 as both are present in row no. (i) (ii), (iv) & absent in row no. (iii), (v).  
 Code of K is 6 as both are present in row no. (i), (ii), (iv), & absent in row no. (iii), (v).  
 Code of N is 3 as both are present in row no. (ii), (iv), (v) & absent in row no. (i), (iii),  
 Code of P is 4 as both are present in row no. (ii) (iii), (v) & absent in row no. (i) (iv).  
 Code of T is 8 as both are present in row no. (ii) & absent in row no. (i), (iii), (iv), (v).  
 Code of V is 9 as both are present in row no. (iv) & absent in row no. (i), (ii), (iii), (v).  
 Code of X is 7 as both are present in row no. (iii), (iv), (v) & absent in row no. (i), (ii).  
 So, we can summaries the result in the following table :

Letters	B	E	I	K	L	N	P	T	V	X
Digits	5	1	2	6	0	3	4	8	9	7

11. 5261
12.  $423 + 324 = 747$
13.  $5281 - 6281 = -1000$
14.  $320 + 3231 - 813 = 2738$

**Directions : (15 to 16) In each questions there is a word written in capital letters with one letter underlined. For each letter in that word there is a code written in small letters. That code is denoted by either (A), (B), (C), (D) or (E) not in the same order. You have to find out the exact code for the underlined letter in the word. The number of that code is the answer. Please note that the same letter appearing in other word(s) may be coded differently.**

**Ex 15. MAGIC**

- (A) km (B) eg (C) ik (D) ce (E) oq

**Sol.**  $M(+2) o (+2) q \iff 'oq'$ ,  $A(+2) (+2) e \iff 'ce'$ ,  $G(+2)i(+2) k \iff 'ik'$ ,  $I(2+)k(+2)m \iff 'km'$  and  $C(+2)e(+2)g \iff 'eg'$

**Ans. (C)**

**Ex 16. QUITE**

- (A) hj (B) su (C) tc (D) pr (E) df

**Sol.**  $Q(-1)p(+2)r \iff 'pr'$ ,  $U(-1)t(+2)v \iff 'tv'$ ,  $I(-1)h(+2) j \iff 'hj'$ ,  $T(-1)s (+2)u \iff 'si'$  and  $E(-1)d(+2)f \iff 'df'$

**Ans. (D)**

## PRACTICE EXERCISE

1. If in any code language **TARGET** is coded as **UYUCNJ** then which word is coded as **VICTORY** in that language ?  
(A) UKZXJXR (B) UKYXJDR (C) UKYXJWD (D) None
2. If in a certain code **MANISH** is written as **NZMRHS**, then how will **RANJITA** be written in the same code ?  
(A) IZMQRGZ (B) IZMPRGZ (C) IZMQRHZ (D) IZMQRIZ
3. If **MENTAL** is written **LNDFMOSUJBKM**, then how would **TEST** be written in that code ?  
(A) UVFGTIIV (B) RSCDQRRS (C) SUDFRQRSM (D) SUDFRTSU
4. If **HERCULES** is coded as **JCTAWJGQ**, then what is the code for **APHORDITE** ?  
(A) CNMJTBKRG (B) CNJMTBKSG (C) CNJMTBKRQ (D) CNJMTCKRG
5. If **BOX** is coded as **CDPQYZ** what will be the last two letters of word in the same code for **HERO** ?  
(A) N, M (B) M, N (C) P, Q (D) Q, P
6. If **IMPORT** is written **USPQNJ**, then how will **CAPITAL** be written in this code ?  
(A) MBUJQBD (B) KZSHOZB (C) MUBJBDQ (D) MBQJUBD
7. If **XY = 600**, **ABC = 6** then, **GO + DO** will be equal to :  
(A) 150 (B) 180 (C) 165 (D) 155
8. If **ANCE** is coded as **3, 7, 29, 11** then **BIOL** will be coded as :  
(A) 5, 31, 21, 25 (B) 5, 31, 19, 25 (C) 5, 29, 19, 25 (D) 5, 29, 19, 17
9. If **ADARSHI** is coded as 53, **SCHOOL** is coded as 66 then the word **STUDENT** will be coded as :  
(A) 90 (B) 97 (C) 89 (D) 96
10. In a certain code **KAMAL** is written as **29894**, **VIJAY** is written as **35196**, then the word **VIMAL** will be coded as  
(A) 29196 (B) 35894 (C) 35194 (D) 35196
11. If **DEAR** is coded as **7** and **BEARS** as **9**, what should be the code for **WAX** ?  
(A) 10 (B) 12 (C) 16 (D) 10
12. If **air** is called **water**, **water** is called green, green is called **dust**, **dust** is called **yellow** and **yellow** is called **cloud**, which of the following does **fish** live in ?  
(A) Air (B) Water (C) Green (D) Dust
13. If **rains** is called **pink**, **pink** is called **cloud**, **cloud** is called **water**, **water** is called **breeze**, and **breeze** is called **moon**, what do you wash your **hands** with ?  
(A) Water (B) Rain (C) Breeze (D) Moon
14. In a certain code **XZM** means **he is bright**, **TCZO** means **every lawn is green**, and **OQCN** means **every wall is green**. Which of the following does mean **every lawn is bright** in that code ?

(A)ZTOM (B)CXZT (C)XOTZ (D)Cannot be determened

15. In a certain code language, **Pat Zoo Sim** means **Eat Good Mangoes**. **Pus Sim Tim** means **Mangoes And Sweets** and **Tim Zoo Kit** means **Purchase Good Sweets**. Which word in the language means **Good** ?  
 (A) Zoo (B) Pus (C) Sim (D) Tim
16. In a certain code **786** means **study very hard**, **958** means **hard work pays** and **645** means **study and work**. Which of the following is the code for **very** ?  
 (A) 8 (B) 6 (C) 7 (D) Cannot be determined
17. If **men are very busy** means **1234**, **busy persons need encouragement** means **4567**, **encouragement is very important** means **3589** and **important persons are rare** means **2680** what is the code for **encouragement**  
 (A) 5 (B) 6 (C) 8 (D) 9

**Directions : (18 to 22) According to a code language, words in column I are written in capital letters. And in column II their codes are given. The codes in column II are jumbeld up. Decode the language and choose the correct code for word given in each question.**

**Column I      Column II**

DELIBERATION	aemrqs
CONSIDERATE	ccehlmo
GHOSTLIKE	cfhmoqqr
WORLDLY	cdgmqrxyz
KNOWLEDGE	adefmopqqsz
ROCKET	cefmopqqsz

- |     |                      |            |            |             |
|-----|----------------------|------------|------------|-------------|
| 18. | KNIGHT<br>(A) ghrxyz | (B) fhmpqr | (C) gprxyz | (D) fgrxyz  |
| 19. | BLOAT<br>(A) ckmps   | (B) cmpqs  | (C) ikpqz  | (D) hmpqz   |
| 20. | NOTICE<br>(A) efhpqs | (B) fghpqr | (C) afmqsz | (D) acdeqs  |
| 21. | SOLACE<br>(A) acdmpq | (B) demopq | (C) acemoq | (D) acedpqr |
| 22. | WORDY<br>(A) adeop   | (B) efhlm  | (C) ehlmo  | (D) fhlmq   |

**Direction : (23 to 25) In each question there is a word written in capital letters with one letter**

*underlined. For each letter in that word there is a code written in small letter. That code is denoted by either (A), (B), (C), (D) or (E) not in the same order. You have to find out the exact code for the underlined letter in the word. The number of that code is the answer. Please not that the same letter appearing in other word(s) may be coded differently.*

23. PAGES  
 (A) b (B) u (C) r (D) x
24. BBREAK  
 (A) z (B) g (C) p (D) c
25. APRIL  
 (A) s (B) f (C) u (D) x  
 (E) o

## ANSWERS

Qu.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	A	A	D	C	C	A	C	B	D	B	C	C	C
Qus.	14	15	16	17	18	19	20	21	22	23	24	25	
Ans.	D	A	C	A	D	A	C	A	C	A	A	C	



## ALPHAVET - TEST & NUMBER RANKING



### ALPHABETICAL ORDER :

You have to arrange these words in order in which they are arranged in a dictionary. In a dictionary the words are placed in alphabetical order w.r.t. the second alphabet of the words and so on (that is, third alphabet, fourth alphabet.....)

**Direction : (1 to 2) Arrange in the correct alphabetical order.**

**Ex 1.** Arrange in alphabetical order and find which word comes in the middle ?  
Select Seldom, Selfish, Seller, Send, Second, Section

**Sol.** The given words can be arranged in the alphabetical order as :  
Second, Section, Seldom, **Select**, Selfish, Seller, Send  
Clearly, **select** comes middle.

**Ex 2.** Arrange the given words in the sequence in which they occur in the dictionary and choose the correct sequence.

1. Precede      2. Precision      3. Precise      4. Precept      5. Preach      6. Prelude

(A) 5, 3, 1, 4, 2, 6      (B) 5, 1, 4, 3, 2, 6      (C) 5, 1, 3, 4, 2, 6      (D) 5, 1, 4, 2, 3, 6.

**Sol.** (B) The correct alphabetical order of the given words is :  
**Preach, Precede, Precept, Precise, Precision, Prelude.** Thus, the correct sequence is **5, 1, 4, 3, 2, 6.**

**Direction : (3) In the following question, a group of letters is given which are numbered 1,2,3,4,5 and 6. Below are given four alternatives containing combinations of these numbers. Select that combination of numbers so that letters arranged accordingly, form meaningful word.**

**Ex 3.** A      C      P      E      T      S

1      2      3      4      5      6

(A) 1, 6, 3, 4, 2, 5      (B) 2, 3, 4, 1, 5, 6      (C) 5, 6, 3, 4, 1, 2      (D) 6, 5, 3, 4, 2, 1

**Sol.** (A) The given letter, when arranged in the order **1, 6, 3, 4, 2, 5.** Form the word **ASPECT.**

**Ex 4.** If any two letters in the word **PRISON** have as many letters between them in the word as there are in the English alphabet, they form an alpha-pair. How many such alpha-pairs are there is the word **PRISON** ?  
(A) 4      (B) 1      (C) 2      (D) 3

- Sol.** (A) Letter in the given word      Letter in the alphabet series  
 (i) Q N      N O  
 (ii) P R I S      P Q R S  
 (iii) R I S Q N      R Q P Q N

**Ex 5.** Number of letters skipped in between adjacent letters in the series is odd. Which of the following series observes this rule ?

- (A) BDHLR      (B) FIMRX      (C) EIMQV      (D) MPRUX

**Sol.** (A) B C D E F G H I J K L M N O P Q R

1      3      3      5

Clearly, in letter series **BDHLR**, the number of letter skipped in between adjacent letters in the series is odd.

**Ex 6.** If you count 21 letter in the English alphabet from the end and 20 letters from the beginning which letter will appear exactly in the middle of the sequence thus formed ?

- (A) M      (B) N      (C) L      (D) O

**Sol.** (A) Consider the English alphabet :

20 Letters from beginning →  
 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  
 ← 21 Letters from the end

By counting 21 letter from the end and 20 letters from the beginning, we get the following sequence in which **M** comes exactly middle.

F G H I J K L M N O P Q R S T

**Ex 7.** If it is possible to make a meaningful word with the first, the fourth, the seventh and the eleventh letters and the word **INTERPRETATION**, which of the following will be the third letter of that word ? If more than one such word can be made, give **M** as the answer and if no such word can be formed, give **X** as the answer.

- (A) T      (B) E      (C) X      (D) M

**Sol.** (D) The first, the fourth, the seventh and the eleventh letters of the word **INTERPRETATION** are **I, E, R** and **T** respectively. The words formed are **RITE** and **TIRE**.

**Ex 8.** In the following scrambled letters are rearranged to form the name of a city, the city so formed is famous for its :

**WILGARO**

- (A) Locks      (B) Steel Plant      (C) Temples      (D) Pottery

**Sol.** (C) They city is **GWALIOR** and it is famous for temples.

**Ex 9.** Choose the one word which can be formed from the letters of the given word.

**RATIONALISATION**

- (A) NATIONALISTIC      (B) NATIONALIST      (C) SITUATION      (D) REALISATION

**Sol.** (B) The word **RATIONALISATION** contains all the letters of the word **NATIONALIST**. So, the word **NATIONALIST** can be formed.

## NUMBER RANKING :

**Ex 10.** How many even numbers are there in the above sequence which are immediately preceded by an odd number and immediately followed by an even number ?

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

(A) 1

(B) 2

(C) 3

(D) 4

**Sol.** (C) We have to find the sequence OEE. O-Odd No. A odd number followed by two even numbers. 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.

**Ex 11.** Nitin was counting down from 32. Sumit was counting upwards, the numbers starting from 1 and he was calling out only the odd numbers. What common number will they call out at the same time if they were calling out at the same speed ?

(A) 19

(B) 21

(C) 22

**Sol.** (D) Nitin : 32 31 30 29 28 27 26 25 24 23 22 21 20.....

Sumit : 1 3 5 7 9 11 13 15 17 19 21 23 25....

Clearly, both will never call out the same number.

**Ex 12.** Thirty six vehicles are parked in a parking lot in a single row. After the first car, there is one scooter. After the second car, there are two scooter. After the third car, there are three scooters and so on. Work out the number of scooters in the second half of the row.

(A) 10

(B) 12

(C) 15

(D) 17

**Sol.** (C) Let C and S denote car and scooter respectively.

Then, the sequence of parking is

C S C S S C S S S C S S S S C S S S / S S C S S S S S S C S S S S S S C

The above sequence has been divided into two equal halves by a line.

Clearly, number of scooters in second half of the row = 2 + 6 + 7 = 15.

**Ex 13.** Manisha ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six students did not participate in the competition and five failed in it. How many students were there in the class ?

(A) 40

(B) 44

(C) 50

(D) 55

**Sol.** (D) Number of students who passé =  $(15 + 1 + 28) = 44$ .

 $\therefore$  Total number of students in the class =  $44 + 6 + 5 = 55$ 

**Ex 14.** If all the number from 7 to 59, which are divisible by 3 are arranged in descending order then which number will be at 10<sup>th</sup> place from the bottom ?

(A) 36

(B) 39

(C) 30

(D) 27

**Sol.** (A) The required numbers in descending order are : 57, 54, 51, 48, 45, 42, 39, 36, 33, 30, 27, 24, 21, 18, 15, 12, 9. The 10<sup>th</sup> number from the bottom is 36.

**Ex 15.** Anil and Sunil are ranked seventh and eleventh respectively from the top in a class of 31 students. What will be their respective ranks from the bottom in the class ?

(A) 20<sup>th</sup> and 20<sup>th</sup>(B) 24<sup>th</sup> and 20<sup>th</sup>(C) 25<sup>th</sup> and 21<sup>st</sup>(D) 26<sup>th</sup> and 22<sup>nd</sup>

**Sol.** (B) Number of students behind Anil in rank =  $(31 - 7) = 24$

So, Anil is 25<sup>th</sup> from the bottom.Number of students behind Sunil in rank =  $(31 - 11) = 20$ So, Sunil is 21<sup>st</sup> from the bottom.

## PRACTICE EXERCISE

1. Arrange the given words in alphabetical order and tick the one that comes last.  
 (A) plane (B) plain (C) player (D) place

**Directions : (2 to 3) In each of the following questions, a group of letters is given which are numbered 1, 2, 3, 4, 5 and 6. Below are given four alternatives containing combinations of these numbers. Select that combination of numbers so that letters arranged accordingly, form a meaningful word.**

2.     **G        A        N        I        M        E**  
        **1        2        3        4        5        6**

(A) 1, 2, 4, 3, 6, 5        (B) 6, 3, 4, 1, 5, 2        (C) 5, 2, 1, 4, 3, 6        (D) 2, 5, 1, 4, 3, 6

3.     **C        E        L        S        M        U**  
        **1        2        3        4        5        6**

(A) 4, 6, 3, 5, 2, 1        (B) 5, 6, 4, 1, 3, 2        (C) 4, 6, 5, 2, 3, 1        (D) 5, 2, 3, 1, 6, 4

4. How many pair of letter are there in the word, '**EXPERIENCED**' which have as many letters between them in the word as in alphabet ?  
 (A) One        (B) There        (C) Four        (D) More than four

5. How many pair of letters are there in the word **REPURCUSSION** which have as many letters between them in the word as in the alphabet.  
 (A) Three        (B) One        (C) Two        (D) More than three

6. Number of letters skipped in between adjacent letters in the series are multiples of 3. Which of the following series observes this rule ?  
 (A) AELPZ        (B) GKOTZ        (C) LORUX        (D) DHLPU

7. Select the series in which the letters skipped in between adjacent letters decrease in order  
 (A) AGMRV        (B) HNSWA        (C) NSXCH        (D) SYDHK

8. If every even letter beginning from **B** is replaced by odd number beginning with 3. Which letter/ number will be the third to the left of the tenth number Letter counting from your right?  
 (A) M        (B) S        (C) 21        (D) 23

9. Which letter should be fourth to the right of twelfth letter from the right if the second half of the alphabet series is reversed ?  
 (A) J        (B) K        (C) L        (D) M

10. If it is possible to make a meaningful word with the second, the fourth, the fifth, the seventh and the eleventh letters of the word **DISRIBUTION** which of the following will be the third letter of that word ? If no such word can be formed give **X** as answer.  
 (A) O        (B) I        (C) B        (D) X



11. A meaningful nine-letter English word is formed using all the alphabets given in the grid below, starting with alphabet of a corner block, moving in clockwise direction and ending at the alphabet in the central grid. What is the fourth alphabet of the word ?

m	m	o
o	y	d
c	t	i

- (A) o (B) d (C) t (D) m

**Directions : (12 to 13) In each of the following questions, find which one word can not be made from the latter's of the given word.**

12. KALEIDOSCOPE  
 (A) SCALE (B) PADLOCK (C) PACKET (D) DIESEL
13. SUPERIMPOSABLE  
 (A) SPIRE (B) REPTILE (C) POSSIBLE (D) REPOSURE
14. In the following series of number's find out how many times, **1,3** and **7** have appeared together, **7** being in the middle and **1** and **3** on either side of **7** ?  
**2 9 7 3 1 7 3 7 7 1 3 3 1 7 3 8 5 7 1 3 7 7 1 7 3 9 0 6**  
 (A) One (B) Two (C) Three (D) Four
15. In the following number series how many 8's are there which are exactly divisible by the numbers which are preceded and followed by it ?  
**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
16. In a Class Vidhya ranks **7<sup>th</sup>** from the top, Divya is **7** ranks ahead of Medha and **3** ranks behind Vidhya Sushma who is **4<sup>th</sup>** from the bottom, is **32** ranks behind Medha. How many students are there is the class ?  
 (A) 52 (B) 49 (C) 50 (D) None of these
17. Three persons **A, B** and **C** are Standing in a queue. There are five persons between **A** and **B** and eight persons between **B** and **C**. If there be three persons ahead of **C** and **21** persons behind **A**, what could be the minimum number of persons in the queue.  
 (A) 41 (B) 40 (C) 28 (D) 27
18. If the alphabets were written in the reverse order, which letter will be the fifth letter to the right of the fourteenth letter from the left.  
 (A) R (B) I (C) S (D) H

Directions : (19 to 25) Study the following information to answer the given questions :

(i) In a class of boys and girls, Amar's rank is 12th and Meeta's rank is 8th.

(ii) Amar's rank among the boys is 6th and Meeta's rank among girls is 3rd.

(iii) In the class Meeta's rank is 52th from the other end.

(iv) From the other end, Amar's rank among the boys is 26th.

19. How many boys are there in the class ?  
 (A) 31 (B) 28 (C) 29 (D) Can't be determined
20. Which of the following is Meeta's rank among the girls from the other end ?  
 (A) 23rd (B) 28th (C) 26th (D) Can't be determined
21. How many boys are there before Meeta ?  
 (A) 4 (B) 5 (C) 3 (D) Can't be determined
22. How many boys are there between Amar and last rank (assuming it is a girl) in the class ?  
 (A) 25 (B) 47 (C) 22 (D) Can't be determined
23. How many boys are there between Amar and Meeta ?  
 (A) One (B) Two (C) Three (D) None of these
24. How many girls are there before Amar ?  
 (A) 5 (B) 6 (C) 7 (D) Can't be determined
25. How many girls are there between Meeta and Amar ?  
 (A) One (B) Two (C) Three (D) Can't be determined

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	C	B	B	D	D	A	D	C	B	C	D	C	B
Que.	14	15	16	17	18	19	20	21	22	23	24	25	
Ans.	C	D	A	C	A	A	C	B	A	D	B	C	



## ➤➤➤ MATHEMATICAL OPERATIONS <<<

You are provided with substituted for various mathematical symbols. This is called **Substitution** method. You are required to put in the real signs in the given equation and then solve the question.

### NOTE :

While attempting to solve a mathematical expression, proceed according to the rule **BODMA** - that is, Brackets, Of, Division, Multiplication, Addition, Subtraction.

**Ex 1.**  $(48 - 12) \div 4 + 6 \div 2 \times 3 = ?$   
 $(48 - 12) \div 4 + 6 \div 2 \times 3 = 36 \div 4 + 6 \div 2 \times 3$  (Solving Bracket)  
 $= 9 + 3 \times 3$  (Solving Division)  
 $= 9 + 9$  (Solving Multiplication)  
 $= 18$  (Solving Addition)

**Ex 2.** If  $\times$  means  $\div$ ,  $-$  means  $\times$ ,  $\div$  means  $+$  and  $+$  means  $-$ , then  
 $(3 - 15 \div 19) \times 8 + 6 = ?$   
 (A) 8 (B) 4 (C) 2 (D) -1

**Sol.** (C) Using the proper signs  
 Expression  $(3 \times 15 + 19) \div 8 - 6 = 64 \div 8 - 6 = 2$

**Ex 3.** If  $\times$  stand for 'addition';  $<$  for 'subtraction',  $+$  stands for 'division',  $>$  for 'multiplication',  $=$  stands for 'equal to',  $\div$  for 'greater than' and  $=$  stands for 'less than', state which of the following is true ?  
 (A)  $3 \times 2 < 4 \div 16 < 2 + 4$  (B)  $2 > 2 + 2 = 10 < 4 \div 2$   
 (C)  $3 \times 4 > 2 - 9 + 3 < 3$  (D)  $5 \times 3 < 7 \div 8 + 4 \times 1$

**Sol.** (B) Using the proper notations in (B), we get the statement as  
 $5 \times 2 \div < 10 - 4 + 2$  or  $5 < 8$ , which is true?

**Direction (4 to 5) Are to be answered with reference to the following explanatory paragraph:**  
**Suppose in view of a number system, a symbol system was substituted, which has digits**  
 $\square, \wedge, Z, \Sigma, *, 5, 6, <, X$  and  $\ominus$  corresponding to the digits, 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 respectively. The digit  $\square$  is used in the same fashion as the digit 0 in the decimal system.

**Ex 4.** Which is equal to  $10^0$  ?

(A)  $\wedge \square \square$

**Sol.** (A)  $10^2 = 100$  means  $\wedge \square \square$

**Ex 5.** What is the sum of  $3 + a + \partial + \Sigma$  ?

(A)  $\wedge Z$  (B)  $\wedge Z$  (C)  $\ominus$  (D)  $\square \Sigma$

**Sol.** (A)  $3 + \$\$ + \Sigma = 3 + 6 + 3 = 12$  means  $\wedge Z$

- Ex 6.** Which one of the four interchanges in signs and numbers would make the given equation correct ?  
 $3 + 5 - 2 = 0$   
 (A) + and -, 2 and 3 (B) + and -, 2 and 5 (C) + and -, 3 and 5 (D) None of these

**Sol.** (A) By making the interchanges given in (A) we get the equation as  
 $2 - 3 + 3 = 0$  or  $0 = 0$  which is true.  
 By making the interchanges given in (B), we get the equation as  
 $3 - 2 + 5 = 0$  or  $6 = 0$ , which is false.  
 By making the interchanges given in (C), we get the equations as  
 $5 - 3 + 2 = 4$  or  $4 = 0$  which is not true.

- Ex 7.** Which of the following conclusions is correct according to the given expressions and symbols ?  
 A : >      B : >      C : ≠      D : =  
 E : ≤      F : <

Expression (pEq and qEr)

- (A) pEr      (B) pFr      (C) eBp      (D) rBq

**Sol.** (A) pEq and pEr  $\Rightarrow p \leq q$  and  $q \leq r \Rightarrow p \leq r \Rightarrow pEr$

- Ex 8.** If  $A + D > C + E$ ,  $C + D = 2B$  and  $B + E > C + D$ , it necessarily follows that  
 (A)  $A + B > 2d$  (B)  $B + D > C + E$  (C)  $A + D > B + E$  (D)  $A + D > B + C$

**Sol.** (D)  $A + D > C + E$

$$\Rightarrow A + D > (2B - D) + E \quad (\because C + D = 2B)$$

$$\Rightarrow A + D > (B + E) + (B - D)$$

$$\Rightarrow A + D > (C + D) + (B - D)$$

$$\Rightarrow A + D > B + C.$$

**Direction : (9) In answering the questions below, use the following information :**

$X \cup Y$  means divide X by Y

$X \uparrow Y$  means multiple X by Y

$X \# Y$  means subtract Y from X

$X \cap Y$  means add Y to X

- Ex 9.** One-fifth of one-tenth of two-third of a number X is given by

- (A)  $X \uparrow (1 \cup 5) \uparrow (1 \cup 10) \uparrow (2 \cup 3)$  (B)  $X(1 \uparrow 5)(1 \uparrow 10)(2 \uparrow 3)$   
 (C)  $X(1 \uparrow 5)(2 \uparrow 10)(2 \uparrow 3)$  (D) can't be determind

**Sol.** (A)  $X \times \frac{1}{5} \times \frac{1}{10} \times \frac{2}{3} = X \uparrow (1 \cup 5) \uparrow (1 \cup 10) \uparrow (2 \cup 3)$

**Directions : (10 to 11) following symbols have been used :**

- x stands for equal to
- < stands for not equal to
- stands for greater than
- + stands for not greater than
- > stands for less than
- = stands for not less than

**Ex 10.** If  $p = q + r$ , then it is possible that  
 (A)  $p \times q - r$  (B)  $p + q - r$  (C)  $p - q - r$  (D)  $p < q < r$

**Sol.** (D) With the notations given, we have :  
 $p = q + r$  means  $p \geq p \leq r$   
 From option (A),  $p \times q - r$  means  $p = q > r$ , this is not true.  
 From option (B),  $p + q - r$  means  $p \leq q > r$ , this is not true.  
 From option (C),  $p - q - r$  means  $p > q > r$ , this is not true.  
 From option (D),  $p < q < r$  means  $p \neq q \neq r$ , this is true,

**Ex 11.** If  $p > q \times r$ , then it is possible that  
 (A)  $p + r + q$  (B)  $p = r - q$  (C)  $p \times q + r$  (D)  $p = q - r$

**Sol.** (A) With the notations given, we have :  
 $p > q \times r$  means  $p < q = r$   
 From option (A),  $p + r + q$  means  $p \leq r \leq q$ , this is true.  
 From option (B),  $p = r - q$  means  $p \geq r > q$ , this is not true.  
 From option (C),  $p \times q + r$  means  $p = q < r$ , this is not true.  
 From option (D),  $p = q - r$  means  $p \geq q > r$ , this is not true.

**Directions : (12 to 15) In the following questions, the symbols, @, @, =, \* and \_ are used with the**

- following meanings**  
 'A @ B' means 'A is greater than B';  
 'A @ B' means 'A is greater than or equal to B';  
 'A = B' means 'A is equal to B';  
 'A \* B' means 'A is smaller than B';  
 'A \_ B' means 'A is either smaller than or equal to B';

Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true.

Give answer (A) if only conclusion I is true ; (B) if only conclusion II is true ; (C) if either I or II is true ; (D) if neither I nor II is true.

**Ex 12. Statements :**  $S @ T$ ,  $M _ K$ ,  $T = K$

**Conclusions:** I.  $T @ M$   
 II.  $T = M$

**Sol.** (C) Given statements :  $S > T$ ,  $M \leq K$ ,  $T = K$ .  
 Relation between T and M :  
 $T = K$ ,  $K \geq M \Rightarrow T \geq M \Rightarrow T > M$  or  $T = M$   
 $\Rightarrow T @ M$  or  $T = M$   
 So, either I or II is true.

**Ex 13. Statements :**  $S * M$ ,  $M @ L$ ,  $L @ P$

**Conclusion :** I.  $S = P$   
II.  $S \leq L$

**Sol.** (D) Given statements :  $S < M, M > L, L \geq P$   
I. Relation between S and P :  
 $S < M, M > L, L \geq P \Rightarrow$  no definite conclusion.  
So, I is not true.  
II. Relation between S and L :  
 $S < M, M > L \Rightarrow$  no definite conclusion.  
So, II is also not true.

**Ex 14. Statements :**  $U = V, V * N, R \leq U$   
**Conclusions :** I.  $R * N$   
II.  $U \geq N$

**Sol.** (A) Given statements :  $U = V, V < N, R \leq U$   
I. Relation between R and N :  
 $R \leq U, U = V, V < N \Rightarrow R < N$  i.e.  $R * N$   
So, I is true.  
II. Relations between U and N :  
 $U = V, V < N \Rightarrow U < N$  i.e.  $U * N$   
So,  $U \geq N$  i.e.  $U \geq N$  is not true.  
Thus, II is false.

**Ex 15. Statements :**  $E \geq U, C * E, C \geq B$   
**Conclusions :** I.  $U = C$   
II.  $E \geq B$

**Sol.** (B) Given statements :  $E \geq U, C < E, C > B$   
I. Relation between U and C :  
 $U \leq E, E > C \Rightarrow$  no definite conclusion.  
So, I is not true.  
II. Relation between E and B :  
 $E > C, C > B \Rightarrow E > B$  i.e.  $E \geq B$   
So, II is true.

## PRACTICE EXERCISE

1. It being given that : > denotes +, < denotes -, + denotes ÷, - denotes =, = denotes 'less than' and × denotes 'greater than', find which of the following is a correct statement.  
 (A)  $3 + 2 < 4 = 9 + 3 < 1$  (B)  $3 > 2 > 4 = 18 + 3 < 2$   
 (C)  $3 > 2 < 4 \times 8 + 4 < 2$  (D)  $3 + 2 < 4 \times 9 + 3 < 3$

**Direction : (2) In the following question, different alphabets stand for various symbol as indicated below :**

Addition : <b>O</b>	Substation : <b>M</b>	Multiplication : <b>A</b>
Division : <b>Q</b>	Equal to : <b>X</b>	Greater than : <b>Y</b>
Less than : <b>Z</b>		

Out of the four alternatives given in the question, only one is correct/

2. (A) 1 O 1 Q 1 M 1 Y 3 Q 1 (B) 2 Q 1 O 20 A 1 Z 6 A 4  
 (C) 3 O 2 O 10 Q 2 X 10 A 2 (D) 5 Q 5 A 5 O 5 Y 5 A 2
3. If 'P' means '+'; 'R' means 'x'; 'S' means '-'; 'T' means '÷' then what is the value of  
 $5 R 9 P 7 S 9 T 3 P 6 = ?$   
 (A) 54 (B) 128 (C) 59 (D) 55
4. If ÷ means +, - means ÷, × means - and + means ×, then  

$$\frac{(32 \times 8) - 8 \times 2}{4 + 18 \times 8 + 9 \div 1} = ?$$
  
 (A) 0 (B) 1 (C) 12 (D) None of these
5. If L denoted ÷, M denotes x, P denotes + and Q denotes -, then which of following statements is true ?  
 (A)  $32 P 8 L 16 Q 4 = -\frac{3}{2}$  (B)  $6 M 18 Q 26 L 13 P 7 = \frac{173}{13}$   
 (C)  $11 M 34 L 17 Q 8 L 3 = \frac{38}{3}$  (D)  $9 P 9 L 9 Q 9 M 9 = -71$

**Directions : (6 to 8) Answer the questions on the basis of the information given below. If '\$' represents '+', '★' represents '-', '#' represents 'x', '@' represents '÷' then answer the following questions bases on the above given representation.**

6. What is the value of  $4 \# 3 \$ 10 @ 5 \$ 8 \# 2 \star 18$  ?  
 (A) 10 (B) 12 (C) 6.8 (D) 11.2
7. Which of the following has the value equivalent of  $5 \$ 6 \# 2 \$ 8 @ 4$  ?  
 (A)  $4 \# 7 \star 12 \$ 2 \# 1$  (B)  $8 \# 2 \star 3 \$ 6 @ 3$  (C)  $8 @ 2 \star 3 \$ 6 \# 3$  (D)  $4 \$ 7 \star 12 \$ 2 \# 1$

8. Which of the given values is greater than  $7 \$ 3 \star 2 \$ 12 @ 4$  ?  
 (A)  $4 \# 3 \$ 6 @ 3 \star 4$  (B)  $5 \# 2 \star 8 @ 4 \$ 3 \# 3 \star 7$   
 (C)  $6 \# 3 \star 18 @ 2 \$ 1 \# 2$  (D)  $9 @ 3 \$ 6 \# 2 \star 2 \# 1$
9. If  $\square \triangle = 7$ ,  $\triangle = 27$ ,  $\square = 81$  then  $\triangle \square = ?$   
 (A) 690 (B) 689 (C) 780 (D) 789
10. Correct the following equations by interchanging two signs :  
 $16 - 21 \div 7 \times 6 + 3 = 31$   
 (A) - and + (B) + and  $\times$  (C)  $\div$  and + (D)  $\div$  and  $\times$
11. Find the correct inference according to given premises and symbols :  
 A : Not greater than B : Greater than C : Not equal to  
 D : Equal to E : Not less than F : Less than  
 (A) pBm (B) pDm (C) pEm (D) pF,
12. If  $A + B > C + D$ ,  $B + E = 2C$  and  $C + D > B + E$ , it necessarily follows that :  
 (A)  $A + B > 2C$  (B)  $A + B > 2D$  (C)  $A + B > 2E$  (D)  $A > C$

**Direction : (13) In answering the questions below, use the following information :**

**X  $\cup$  Y means divide X by Y**  
**X  $\uparrow$  Y means multiply X by Y**  
**X # Y means subtract Y from X**  
**X  $\cap$  Y means add Y to X**

13. A receives X number of balls. He gives 10% of his ball to B, 15% of his ball to C and 12% of his balls to D. How many balls does he have with him now ?  
 (A)  $X \cap X \uparrow (10 \cup 100) \cap X \uparrow (15 \cup 100) \# X \uparrow (12 \cup 100)$   
 (B)  $X \cap X \uparrow (10 \uparrow 100) \cap X (15 \uparrow 100) \cap X \uparrow (1 \uparrow 100)$   
 (C)  $X \# [X \uparrow (10 \cup 100) \cap X \uparrow (15 \cup 100) \cap X \uparrow (12 \cup 100)]$   
 (D) None of these

**Directions : (14 to 15) Some symbols are given below. These symbols denote some relationship between number**

$\Delta$  = greater than  
 $\theta$  = equal to  
 $\square$  = not less than  
 $\times$  = less than  
 $+$  = not greater than  
 $\phi$  = not equal to

14.  $a \times b \theta c$  does not mean  
 (A)  $a \Delta b \phi c$  (B)  $a + b \theta c$  (C)  $a \phi b \theta c$  (D)  $b \theta c \square a$



15.  $c + b \times a$  means

(A)  $a \times b \theta c$

(B)  $c \Delta b \Delta a$

(C)  $c \times b \times a$

(D)  $b \theta c \Delta a$

Directions : (16 to 17) the following symbols have been used L

$x$  : Stands for equal to

$<$  : Stands for not equal to

$-$  : Stands for greater than

$+$  : Stands for not greater than

$>$  : Stands for less than

$=$  : Stands for not less than

16. If  $p \times q \times r$ , then it is not possible that :

(A)  $p - q = r$

(B)  $p = q + r$

(C)  $p + q + r$

(D)  $p = q = r$

17. If  $p - q + r$ , then it is possible that :

(A)  $p = q > r$

(B)  $p < q - r$

(C)  $p + q \times r$

(D)  $p \times q \times r$

Directions : (18 to 22) In the following questions the symbols \$, @,  $\subset$ ,  $\supset$  and  $\neq$  are used with the following meaning.

$A \$ B$  means A is greater than B

$A @ B$  means A is either greater than or equal to B

$A \subset B$  means A is equal to B

$A \supset B$  means A is smaller than B

$A \neq B$  means A is either smaller than or equal to B

Now in each of the following questions assuming the given statements to be true, find which of the two conclusions I and II given below them is / are definitely true ? Give answer (A) if only conclusion I is true, (B) if only conclusion II is true (C) if neither I nor II is true (D) if both I and II are true.

18. Statements :  $P @ Q$ ,  $M \neq N$ ,  $N \subset Q$

Conclusions : I.  $P \$ M$

II.  $N \neq P$

19. Statements :  $D \subset X$ ,  $F @ Y$ ,  $D \$ F$

Conclusions : I.  $X @ Y$

II.  $Y \neq D$

20. Statements:  $M \subset P$ ,  $S \$ T$ ,  $M @ T$

Conclusions: I.  $T \neq P$

II.  $S \supset T$

21. Statements :  $U \supset V$ ,  $X \$ W$ ,  $U \supset W$

Conclusions : I.  $W \$ V$

II.  $U \subset X$

22. Statements :  $G \$ H, J \neq K, H \subset K$

Conclusions : I.  $G \$ K$

II.  $J \subset K$

**Directions :** (23 to 25) In the following questions find out the digits corresponding to the letters representing those digits in the multiplication give below.

$$\begin{array}{r} 9bc \\ \underline{35d} \\ 3a4b \\ 4a35 \\ \underline{2961} \\ 34a39b \end{array}$$

23. b stands for :  
 (A) 6 (B) 7 (C) 8 (D) 9
24. c stands for :  
 (A) 7 (B) 6 (C) 5 (D) 4
25. d stands for :  
 (A) 2 (B) 3 (C) 4 (D) 5

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	C	B	D	B	D	B	C	D	B	B	D	A	C
Que.	14	15	16	17	18	19	20	21	22	23	24	25	
Ans.	A	C	A	A	B	C	A	C	A	C	A	C	



## ►► PUZZLE TEST ◀◀

**Directions :** (1 to 5) Read the following information carefully and answer the questions given below it.

- I. Five professors (Dr. Joshi, Dr. Davar, Dr. Natrajan, Dr. Choudhary and Dr. Zia) teach five different subjects (zoology, physics, botany, geology and history) in four universities (Delhi, Gujarat, Mumbai, and Osmania). Do not assume and specific order.
- II. Dr. Choudhary teaches zoology in Mumbai University.
- III. Dr. Natranjan is neither in Osmania University nor in Delhi University and he teaches neither geology nor history.
- IV. Dr. Zia teaches physics but neither in Mumbai University nor in Osmania University.
- V. Dr. Joshi teaches history in Delhi University.
- VI. Two professors are from Gujarat University.
- VII. One professor teaches only one subject and in one University only.

- Ex 1.** Who teaches geology ?  
(A) Dr Natrajan (B) Dr. Zia (C) Dr. Davar (D) Dr. Joshi
- Ex 2.** Which university is Dr. Zia from ?  
(A) Gujarat (B) Mumbai (C) Delhi (D) Osmania
- Ex 3.** Who teaches botany ?  
(A) Dr. Zia (B) Dr. Davar (C) Dr. Joshi (D) Dr. Natrajan
- Ex 4.** Who is from Osmania University ?  
(A) Dr. Natrajan (B) Dr. Davar (C) Dr. Joshi (D) Dr. Zia
- Ex 5.** Which of the following combinations is correct ?  
(A) Delhi University - Dr. Zia (B) Dr. Choudhary - geology  
(C) Dr. Davar - Mumbai University (D) Dr. Natrajan - Gujarat University.

**Sol. :** (1 to 5)

From the given information in the question :

From II, we get Dr. Choudhary teaches zoology in Mumbai University.

From III, We get Dr. Natrajan is neither in Osmania nor in Delhi University. Therefore, he will be either at Mumbai or Gujarat University. Similarly, as he teaches neither geology nor history, therefore, he must be teaching physics or botany. ....(1)

From IV,

Dr. Zia → Physics but as he is not teaching in either Mumbai or Osmania University, he must be teaching either in Delhi or Gujarat University .....(2)

Form V, we get Dr. Joshi teaches history in Delhi University

Form (1) and (2), we conclude that Dr. Natarajan teaches botany.

And form (1), (2) and VI, we get both Natarajan and Zia teach in Gujarat University.

Finally, On summarisation we can prepare the following table.

Names	University	Subject
Dr. Joshi	Delhi	History
Dr. Davar	Osmania	Geology
Dr. Natrajan	Gujarat	Botany
Dr. Choudhary	Mumbai	Zoology
Dr. Zia	Gujarat	Physics

On the basis of the above table, rest of the questions can be solved very easily.

**Sol 1.** (C) Dr. Davar teaches geology.

**Sol 2.** (A) Dr. Zia is form Gujarat University.

**Sol 3.** (D) Dr. Natarajan teaches botany.

**Sol 4.** (B) Dr. Davar is from Osmania University

**Sol 5.** (D) Dr. Natranjan - Gujarat University is the correct combination.

**Ex 6.** Ramesh is taller than Vinay who is not as tall as Karan. Sanjay is taller than anupam but shorter than Vinay. Who among them is the latest ?

(A) Ramesh (B) Karan (C) Vinay (D) Cannot be determined

**Sol.** (D) In this questions ranking of Karan is not defined. Consequently, either Ram or Karan Occupies the top position with regard to height. Hence, option (d) is the correct choice.

**Directions (7 to 11) Read the following information carefully and answer the questions given below it :**

There are five men A,B,C,D and E and six women P,Q,R,S,T and U. A, B and R are advocates; C,D,P,Q and S are doctors and the rest are teachers. Some teams are to be selected from amongst these eleven persons subject to the following conditions :

A, P and U have to be together.

B cannot go with D or R.

E and Q have to be together

C and T have to be together.

D and P cannot go together.

C cannot go with Q.

**Ex 7.** If the team is to consist of two male advocates, two lady doctors and one teacher, the members of the team are

(A) A B P Q U (B) A B P U S (C) A P R S U (D) B E Q R S

**Sol.** (B) The made advocates are A and B, lady doctors are P, Q and S ; teachers are E, T and U. Now A and B will be selected/

A, P and U have to be together. Now, we have to select one lady doctor more. It can be Q or S. But Q and E have to be together. Since E is not selected, so S will be selected. Thus, the team is A B P U S.

- Ex 8.** If the team is to consist of one advocate, two doctors, three teachers and C may not go with T, the members of the team are :  
 (A) A E P Q S U      (B) A E P Q T U      (C) B E Q S T U      (D) E Q R S T U

**Sol.** (B) The advocates are A, B are R; doctors are C, D P, Q, S ; teachers are E, T and U. The team consists of 3 teachers i.e. E, T, U. Now A, P and U have to be together. E and Q have to be together. Thus, the team is A E P Q T U.

- Ex 9.** If the team is to consist of one male advocate, one male doctor, one lady doctor and two teachers, the members of the team are :  
 (A) A C P T U      (B) A D E P T      (C) A D E P U      (D) B C E Q U

**Sol.** (A) The male advocates are A and B ; male doctors are C and D ; lady doctors are P, Q and S; teachers are E, T and U. If A selected, P and U will be selected. D and P cannot go together. So, a male doctor C will be selected. C and T have to be together. Thus, the team is A C P T U. If B is selected, D will not be selected. So, male doctor C will be chooses. C and T have to be together. Now, the second teacher to be selected is E or U. But, U cannot go without A. So, E will be selected. E and Q have to be together. Thus, the team can also be B C E Q T.

- Ex 10.** If the team is to consist of one advocate, three doctors and one male teacher, the members of the team are:  
 (A) A D P S U      (B) C D R S T      (C) D E Q R S      (D) D E Q R T

**Sol.** (C) The advocates are A, B and R ; the doctors are C, D P, Q and S; male teachers is E. Clearly, E will be selected. E and Q have to be together. C and Q cannot be together. So, C will not be selected. P also cannot be selected because U is not selected. So, two other doctors D and S will be selected. P is not selected, So A will not be selected. D is selected, so B cannot be selected. Thus, the team is D E Q R S.

- Ex 11.** If the team is to consist of two advocates, two doctors, two teachers and not more than three ladies, the members of the team are :  
 (A) A B C P T U      (B) A C P R T U      (C) A E P Q R T      (D) D C E Q R T

**Sol.** (a) A C P R T U and A E P Q R T are wrong because each of these combinations consist of four ladies. B C E Q R T is correct because B and R cannot to gather.

**Direction: (12 to 15) Read the following paragraph carefully**

Four workmen A, B, C and D and three men E, F and G play bridge, a game four players.

- (i) The group consists of three married couples and a widow.
- (ii) Spouses are never partners in game.
- (iii) No mare than one married couple ever plays in the same game.
- (iv) One day they played four games as follows.  
 A and E versus B and F.  
 A and G versus D and F.  
 B and C versus F and G.  
 C and E versus D and G.

- Ex 12.** Whom is E married to ?  
 (A) A      (B) B      (C) C      (D) D

**Ex 13.** Whose if F married to ?

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

**Ex 14.** Whose is G marries to ?

- (A) A (B) B (C) C (D) d

**Ex 15.** Which of the following is a widow ?

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

**Sol. (12 to 15):**

From (iv), is married ether to A or to C. If F is married to A, Then G is married to B or to C. If G is marries to B, then E is married to D ; if G is married to C, then E is married to B or to D. If F is married to C, then G is married to B ; then E is married to D. Hence, the married couples are : FA, GB, ED or FA, GC, EB of FA, GC, ED or FC, GB, ED. Of these, only FA, GB, ED does not contradict any of the statements.

**Sol 12.** (D) E is married to D.

**Sol 13.** (A) F a is married to A.

**Sol 14.** (B) G is married to B.

**Sol 15.** (C) C is widow.

**Ex 16.** A vagabond runs out of cigarettes. He searches for the stubs, having learnt that 7 stubs can make a new cigarette, good enough to be smoked, he bathers 49 stubs, If has smokes 1 cigarette every three - quarters of an hour, how long will his supply last ?

- (A) 5.25 hr (B) 6 hr (C) 4.5 hr (D) 3 hr

**Sol.** (B) He has got  $= \frac{49}{7} = 7$  cigarettes.

∴ The duration of time he will take to smoke these 7 cigarettes  $= 7 \times \frac{3}{4} \text{ hr} = 5.25 \text{ hr}$  (i.e. hr and 1 min). Now

note that after he has smoked these 7 cigarettes, he will collect 7 more stubs (one from each), form which

he will be able to make another cigarette. This will take him another  $\frac{3}{4} \text{ hr}$  (45 min) to smoke. Therefore, total

time taken = 6 hr.

**Direction : (17 to 18) Read the following information and answer the questions that follow.**

**There are 70 clerks working with M/s. Jha Lal Khanna & Co. chartered accountant, of which 30 are female.**

- I. 30 clerks are married.**
- II. 24 clerks are above 25 years of age**
- III. 19 Married clerks are above 25 years of age ; among them 7 are males.**
- IV. 12 males are above 25 years of age**
- V. 15 males are married.**

**Ex 17.** How many unmarried girls are there ?  
 (A) 12 (B) 15 (C) 18 (D) 10

**Ex 18.** How many of these unmarried girls are above 25 ?  
 (A) 12 (B) 15 (C) 4 (D) 0

**Sol. (17 to 18) :** From the given data, we can make the following table with the help of which rest of the questions can be solved very easily.

	Male (40)	Female (30)
Above 25		
Married	7	12
Unmarried	5	0
Below 25		
Married	8	3
Unmarried	20	15
Total	40	30

**Sol 17.** There are 15 unmarried girls.

**Sol 18.** In these 15 unmarried girls no one is above 25.

## PRACTICE EXERCISE

**Direction : (1 to 5) Study the following information carefully and answer then questions given below it :**

There are five friends A, B, C, D and E. Two of them are businessmen while the other three belong to different occupations viz. medical, engineer and legal. One businessman and the lawyer stay in the same locality S, while the other three stay in three different localities P, Q and R. Two of these five persons are Hindus while the remaining three come from three different community's viz. Muslim, Christian and Shikh. The lawyer is the oldest in age while one of the businessmen who runs a factory is the youngest. The other businessman is a cloth merchant and age wise lies between the doctor and the lawyer. D is a cloth merchant and stays in locality S while E is a Muslim and stays in locality R. The doctor is a Christian and stays in locality P, B is a Shikh while A is a Hindu and runs a factory.

- Who stays in locality Q ?  
 (A) A (B) B (C) C (D) E
- What is E's occupation ?  
 (A) Business (B) Engineer (C) Lawyer (D) Doctor

3. Age wise who among the following lies between A and C ?  
(A) Lawyer (B) Doctor (C) Cloth merchant (D) Engineer
4. What is B's occupation ?  
(A) Business (B) Engineer (C) Lawyer (D) Doctor
5. What is C's occupation ?  
(A) Doctor (B) Lawyer (C) Engineer (D) Business

**Directions : (6 to 10) Read the information given below and answer the questions.**

**The age and height of six children in a class are as follows :-**

**(i) A is taller and older than B but shorter and younger than C.**

**(ii) D is taller than E who is not as tall as B.**

**(iii) The oldest is the shortest.**

**(iv) The youngest would be fourth if the children stood in a line according to their height and one started counting from the tallest.**

**(v) D is younger than F but older than E who is older than C.**

6. Who among them is the tallest ?  
(A) B (B) E (C) C (D) Data inadequate
7. Whose is older than B but younger than C ?  
(A) F (B) D (C) A (D) Data inadequate
8. Which of the following statements is definitely true ?  
(A) D is the most old person (B) B has the max height  
(C) A is older than D (D) F is the shortest
9. Which of the following is the correct order of height in descending order ?  
(A) A, C, D, B, E, F (B) F, D, E, C, A, B (C) D, C, A, B, E, F (D) C, D, A, B, E, F
10. Whose Rank in height cannot be positioned definitely ?  
(A) B (B) D (C) C (D) E

**Directions (11 to 15) Study the information given below and answer the questions that follow.**

**(i) Six plays P, Q, R, S, T and U are to be organised from Monday to Saturday i.e. 10 to 15 one play each day.**

**(ii) There are two plays between R and S and one play between P and R.**

**(iii) There is one play between U and T and T is to be organised before U.**

**(iv) Q is to be organised before P, not necessarily immediately.**

**(v) The organisation does not start with Q.**

11. The organisation would start from which play ?  
(A) P (B) S (C) T (D) None



12. One which data is play T be organised ?  
 (A) 10th (B) 11th (C) 12th (D) None
13. The organisation would end with which play ?  
 (A) P (B) Q (C) S (D) None
14. Whish day is play Q organised ?  
 (A) Tuesday (B) Wednesday (C) Thursday (D) None
15. Which of the following is the correct sequence of organising plays ?  
 (A) PTRUQS (B) QSTURP (C) SUTRQP (D) None

**Directions : (16 to 20) Study the following information carefully and answer the questions that follow :**

**A team of five is to be selected from amongst five boys A, B, C, D and E and four girls P, Q, R and S.**

**Some criteria for selections 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 cannot be put with B.**

**Unless otherwise stated, these criteria are applicable to all the questions below :**

16. 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
17. If R one of the members, the other members of the team are :  
 (A) P S A D (B) Q S A D (C) Q S C E (D) S A C E
18. If two of the members are girls and D is one of the members, the members of the team other D are :  
 (A) P Q B C (B) P Q C E (C) P S A B (D) P S C E
19. 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
20. In including P at least three members are girls, the members of the team other than P are :  
 (A) Q S A B (B) Q S B D (C) Q S C E (D) R S A D

Directions : (21 to 25) Read the following information carefully and answer the questions given below.

- I. There is a family of six persons- L, M, N, O, P and Q. They are professor, businessman, chartered account, bank manager, engineer and medical representative, not necessarily in that order.
- II. There are two married couples in the family.
- III. O, the bank manager is married to the lay professor.
- IV. Q, the medical representative, is the son of M and brother of P.
- V. N, the chartered accountant, is the daughter - in law of L.
- VI. The businessman is married to the chartered accountant.
- VII. P is an unmarried engineer.
- VIII. L is the grandmother of Q.

21. How is P related to Q.  
 (A) Brother (B) Sister (C) Cousin (D) Either brother or sister
22. Which of the following is the profession of M ?  
 (A) Professor (B) Chartered accountant  
 (C) Businessman (D) Medical representative
23. Which of the following is the profession of L ?  
 (A) Professor (B) Chartered accountant (C) Businessman (D) Engineer
24. Which of the following is one of the couples ?  
 (A) QO (B) OM (C) PL (D) None of these
25. How is O related to Q ?  
 (A) Father (B) Grandfather (C) Uncle (D) Brother
26. You have 12 similar looking coins. 11 of them weigh the same. One of them has a different weight, but you don't know whether it is heavier or lighter. You also have a scale. You can put coins on both sides of the scale and it'll tell you which side is heavier or will stay in the middle if both sides weight the same. What is the minimum number of weighing required to find out the odd coin.  
 (A) 3 (B) 4 (C) 5 (D) 6

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	A	B	D	C	A	D	C	D	D	B	B	C	A
Que.	14	15	16	17	18	19	20	21	22	23	24	25	26
Ans.	A	D	A	D	C	D	A	D	C	A	D	B	B



# SEATING ARRANGEMENT



**Directions : (1 to 5) Read the following information carefully and answer the questions given below it.**

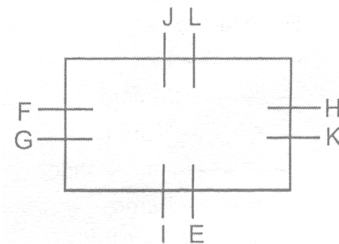
- I.** Eight persons, E, F, G, H, I, J, K and L are seated around a square table - two on each side.
- II.** There are three lady members and they are not seated nest to each other.
- III.** J is between L and F.
- IV.** G is between I and F.
- V.** H, a lady member, is second to the left of J.
- VI.** L, a male number, is seated opposite of E, a lady member.
- VII.** There is lady member between F and I.

- Ex 1.** Who among the following is seated between E and H ?  
 (A) F (B) I (C) J (D) None of these
- Ex 2.** How many persons are seated between K and F ?  
 (A) One (B) Two (C) Three (D) Cannot to determined
- Ex 3.** Who among the following are the three lady members ?  
 (A) E, G and J (B) E, H and G (C) G, H and J (D) Cannot be determined
- Ex 4.** Who among the following is to the immediate left of F ?  
 (A) G (B) I (C) J (D) Cannot be determined
- Ex 5.** Whish of the following is true about J ?  
 (A) J is a male member (B) J is a female member  
 (C) Sex of J cannot be determined (D) Position of J cannot be determined

**Sol. (1 to 5) :** On the basis of the given information, we arrive at the following sting plan the does not violate any of the given conditions.

And on the basis of the above figure rest of the question are solved as follows :

1. (D) K is seated between E and H.
2. (C) Three persons H, L and J are seated between K and F.
3. (B) The three lady members are E, H and G.
4. (C) J is to the immediate left of F.
5. (A) Clearly, J is a male member.



**Direction : (6 to 10 )** Read the following information carefully and answer the questions given below it. In a car exhibition, seven cars of seven different brands, viz Cadillac, Ambassador, Fiat, Maruti, Mercedes, Bedford and Fargo were displayed in a row, facing east direction such that :

- I. Cadillac was to the immediate right of Fargo.**
- II. Fargo was fourth to the right of Fiat.**
- III. Maruti was between the Ambassador and Bedford.**
- IV. Fiat, which was third to the left of Ambassador, was at one of the extreme ends.**

- Ex 6.** Which of the following was the correct position of the Mercedes ?  
 (A) To the Immediate right of Fargo (B) To the Immediate left of Bedford  
 (C) Between Bedford and Fargo (D) Fourth to the right of Maruti
- Ex 7.** Which of the following is definitely true ?  
 (A) Fargo is between Ambassador and the Fiat (B) Cadillac is to the immediate left of Mercedes  
 (C) Fargo is to the immediate right of Cadillac (D) Maruti is fourth to the right of Mercedes
- Ex 8.** Which cars are neighbors of Cadillac ?  
 (A) Ambassador and maruti (B) Maruti and Fiat  
 (C) Fiat and Mercedes (D) Mercedes and Fargo
- Ex 9.** Which of the following is definitely true ?  
 (A) Maruti is to the immediate left of Ambassador  
 (B) Bedford is to the immediate left of Fiat.  
 (C) Bedford is at one of the ends  
 (D) Fiat is second to the right of Maruti,
- Ex 10.** Which of the following groups of cars is to the right of the Ambassador ?  
 (A) Cadillac, Fargo and Maruti (B) Maruti, Bedford and Fiat  
 (C) Mercedes, Cadillac and Fargo (D) Bedford, Cadillac and Fargo

**Sol. (6 to 10) :** According to the given question,

From I  $\left. \begin{array}{l} \text{Fargo} \\ \text{Cadillac} \end{array} \right\} \dots\dots(i)$

From II  $\left. \begin{array}{l} \text{Fiat} \\ \text{ } \\ \text{ } \\ \text{ } \\ \text{Fargo} \\ \text{Cadillac} \end{array} \right\} \dots\dots(ii)$

From III, we get  
 \_\_\_\_\_ Fiat  
 \_\_\_\_\_ Bedford  
 \_\_\_\_\_ Maruti  
 \_\_\_\_\_ Ambassador  
 \_\_\_\_\_ Fargo  
 \_\_\_\_\_ Cadillac  
 \_\_\_\_\_ Mercedes [logically it has to be here only]

From IV

\_\_\_\_\_ Fiat

\_\_\_\_\_

\_\_\_\_\_ Ambassador

\_\_\_\_\_ Fargo

Hence, the sequence of cars is as follows :

Fiat, Bedford, Maruti, Ambassador, Fargo, Cadillac, Mercedes/

6. (D) Clearly, Maruti is in the third place and Mercedes in the seventh, i.e. Mercedes is four to the right of Maruti.
7. (B) Clearly, Cadillac is in the sixth place, to the immediate left of Mercedes, which is in the seventh place (from the top).
8. (D) On the sides of the Cadillac are the Fargo and the Mercedes.
9. (A) Clearly, Maruti is in third place (from top), and is to the immediate left of the Ambassador, which is in the fourth place.
10. (C) To the right of Ambassador are Fargo, Cadillac and Mercedes.

**Directions : (11 to 12) Answer the questions based on the following information.**

**6 men R, S, T, U, V and W set around circular table playing cards. It was noticed that no two men the initial letters of whose names are adjacent in the alphabetical order, sat next to each other, U was opposite of R. V was not to the immediate right of R.**

**Ex 11.** Who sat to the immediate left of R ?

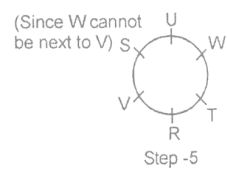
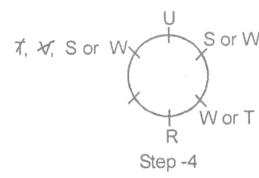
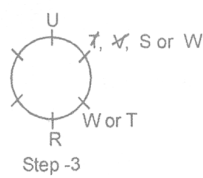
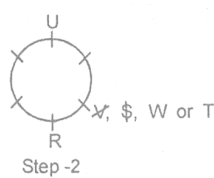
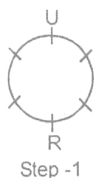
- (A) S (B) T (C) V (D) W

**Ex 12.** Who sat to the immediate right of R ?

- (A) S (B) T (C) V (D) W

**Sol. (11 to 12):**

- Step - 1.** Circular table - 6 men is 6 positions.
- 2.** People with names in alphabetical order do not sit next to each other.
- 3.** U is opposite of R.
- 4.** Also V did not sit on the immediate right of R.



11. (C) Clearly, V is to immediate left of R.
12. (B) Clearly, T sat to immediate right of R.

**Ex 13.** In the Olympic games, flags of 6 nations were hoisted in the following way. The flag of America was to the left of Indian Tricolour and to the right of the flag of France. The flag of Australia was on the right of the Indian flag but to the left of the flag of Japan, which was to the left of the flag of China. Find the two flags which are in the centre.

- (A) America and India (B) Japan and Australia  
(C) America and Australia (D) India and Australia

**Sol.** (D) Clearly, the correct sequence is :  
France, America, India, Australia, Japan, China.  
The two flags in the centre are of India and Australia.

## PRACTICE EXERCISE

**Directions (1 to 5) :** Study the following information carefully and answer the questions given below it:

- (i) Eleven students A, B, C, D, E, F, G, H, I, J and K are sitting in a row of the class facing the teacher.  
(ii) D, Who is to the immediate left of F, is second to the right of C.  
(iii) A, is second to the right of E, who is at one of the ends.  
(iv) J is the immediate neighbor of A and B and third to the left of G.  
(v) H is to the immediate left of D and third to the right of I.

1. Who is sitting in the middle of the row ?  
(A) C (B) I (C) B (D) G
2. Which of the following groups of friends is sitting to the right of G ?  
(A) IBJA (B) ICHDF (C) CHDF (D) CHDE
3. In the above sitting arrangement, which of the following statements is superfluous?  
(A) i (B) ii (C) iii (D) None is superfluous
4. Which of the following statements is true in the context of the above sitting arrangements ?  
(A) There are three students sitting between D and G.  
(B) G and C are neighbors sitting to immediate right of H.  
(C) B is sitting between J and I.  
(D) K is sitting between A and J.

5. If E and D, C and B, A and H & K and F interchange their positions, which of the following pairs of students is sitting at the end ?  
(A) D and E (B) E and F (C) D and K (D) K and F

**Directions : (6 to 10) Study the given information carefully and answer the questions that follow :**

**Seven friends Kamla, Manish, Rohit, Amit, Gaurav, Pritam and Priya are sitting in a circle. Kamla, Manish, Rohit, Amit, Gaurav, Pritam and Priya are sitting in a circle. Kamla, Manish, Rohit, Amit, Pritam and Priya are sitting at equal distances from each other.**

**Rohit is sitting two places right of Pritam, who is sitting one place right of Amit. Kamla forms an angle of 90 degrees from Gaurav and an angle of 120 degrees from Manish. Manish is just opposite to Priya and is sitting on the left of Gaurav.**

6. Who is the only person sitting between Rohit and Manish ?  
(A) Pritam (B) Amit (C) Gaurav (D) Kamla
7. Gaurav is not sitting at equal distances from  
(A) Rohit and Pritam (B) Amit and Kamla (C) Manish and Pritam (D) All of the above
8. Gaurav is sitting ..... of Priya.  
(A) to the left (B) to the right (C) two places right (D) None of these
9. The angle between Gaurav and Manish in the clockwise direction is  
(A)  $150^\circ$  (B)  $180^\circ$  (C)  $210^\circ$  (D) None of these
10. Which of the following statements is not correct >  
(A) Pritam is between Manish and Kamla  
(B) Manish is two places away from Priya  
(C) Gaurav is sitting opposite to Pritam  
(D) All of the above

**Directions : (11 to 14) A, B, C and D are to be seated in a row. But C and D cannot be together. Also B cannot be at the third place.**

11. Which of the following must be false ?  
(A) A is at the first place (B) A is at the second place  
(C) A is at third place (D) A is at the fourth place
12. If A is not at the third place, then C has which of the following options ?  
(A) The first place only (B) The third place only  
(C) The first and third place only (D) Any of the places
13. If A and B are together, then which of the following must be necessarily true ?  
(A) C is not at the first place (B) A is at the third place  
(C) D is at the first place (D) C is at the first place

**Directions : (14) Refer to the data below and answer the questions that follows :**

*There are nine chairs in a row, each numbered 1 to 9 from left to right. Six friends are sitting on these chairs Megha, Sapna and Riya are neither sitting at chair 1 nor at chair numbered 9. Beena and Megha does not have anybody sitting adjacent to them. There is only one empty chair between Megha and Riya. Charu is adjacent to both Jiya and Riya. Sapna is sitting at the seat numbered 2.*

14. Megha is sitting on which of the following chairs ?  
 (A) 4 (B) 5 (C) 7 (D) 8

**Direction : (15) Six friends are sitting around a circular table at equal distances from each other. Ramola is sitting two places right of Komolika who is exactly opposite to Anu. Anu is sitting on the immediate left of Pallavi, who is exactly opposite to Mandira, natasha is also sitting at the table.**

15. Which of the following statements is not correct ?  
 (A) natasha and Ramola are exactly apposite to each other.  
 (B) Mandira and Natasha are at equal distance from Komolika.  
 (C) Angle subtended by Manidra and Natasha is same at the angle subtended by Ramola and Pallavi at the centre of the table.  
 (D) Natasha is on the immediate left of Pallavi.

**Directions : (6 to 20) Stud the following information to answer the given question.**

- (i) Eight friends A, B, C, D, E, F, G and H are seated in a circle facing centre.  
 (ii) D is between B and G and F is between A and H.  
 (iii) E is second to the right of A.

16. Which of the following is A's position ?  
 (A) left of F (B) Right of F (C) Between E and F (D) can't be determined
17. Which of the following is C's position ?  
 (A) Between E and A (B) Between G and E  
 (C) Second to the left of B (D) Can't be determined
18. Who are the neighbors of D ?  
 (A) B and C (B) C and E (C) B and G (D) B and G or B and H
19. If the positions of B and G and D and A are interchanged then who is sitting between B and G in new position.  
 (A) D (B) A (C) H (D) E
20. If B is sitting opposite to C and H is sitting opposite to F ?  
 (A) B (B) G (C) A (D) D

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	D	C	D	C	C	C	D	D	D	D
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	A	C	B	C	D	B	A	C	B	B





# BLOOD RELATIONS



Problems on Blood Relations involve analysis of information showing blood relationship among members of a family. In the questions, as chain of relationship is given in the form of information and on the basis of these information relation between any two members of the chain is asked. Students are supposed to be familiar with the knowledge of different relationship in a family.

Grandfather's son	Father or uncle
Grandmother's son	Father or uncle
Grandfather's only son	Father
Grandmother's only son	Father
Mother's or Father's mother	Grandmother
Mother's or Father's father	Grandfather
Grandfather's only daughter-in-law	Mother
Grandmother's only daughter-in-law	Mother
Mother's or Father's son	Brother
Mother's or Father's daughter	Sister
Mother's or Father's sister	Sister-in-law
Son's wife	Daughter-in-law
Daughter's husband	Son-in-law
Brother's son	Nephew
Brother's daughter	Niece
Uncle or Aunt's son or daughter	Cousin
Sister's husband	Brother-in-law
Brother's wife	Sister-in-law

- Ex 1.** If  $P \$ Q$  means P is the father of Q,  $P \# Q$  means P is mother of Q, &  $P * Q$  means P is the sister of Q. Then how is Q related to N if  $N \# L \$ P * Q$   
 (A) grandson (B) granddaughter (C) nephew (D) data inadequate

**Sol.** (D) The sex of Q is not given hence the exact relation ship b/w N & Q cannot be established.

- Ex 2.** A is the brother of B, C is the brother of A. To establish a relationship between B & C, which of the following information is required.  
 I Sex of C  
 (A) only I is required (B) only II is required  
 (C) both I and II are required (D) Neither required

**Sol.** (B) Is it clear that C is the Brother of B but how B is related to C depends on the sex of B.

**Ex 3.** Pointing towards a man in the photograph, lady said "the father of his brother is the only son of my mother". How is the man related to day ?

- (A) Bother (B) Son (C) Cousin (D) Nephew

**Sol.** (D) The father of this brother means "his father" is the only son of my mother means "my brother". If means lady is the father's sister of the man's father.

**Directions : (4 to 7)**

**A + B** means 'A is father of B'

**A - B** means 'A is wife of B'

**A × B** means 'A is brother of B'

**A ÷ B** means 'A is daughter of B'

**Ex 4.**  $P \div R + S + Q$ , which of the following is true ?

- (A) P is daughter of Q (B) Q is aunt of P (C) P is aunt of Q (D) P is mother of Q

**Sol.** (C) 'S + Q' & 'R + S' means R is the grandfather of Q. Now  $P \div R$  means P is daughter of R. This clearly means P is aunt of Q

**Ex 5.** If  $P - R + Q$ , which of the following is true

- (A) P is mother of Q (B) Q is daughter of P (C) P is aunt of Q (D) P is sister of Q

**Sol.** (A)  $P - R + Q$ , represents R is the father of Q, and P is the wife of R,  $\therefore$  P is the mother of Q

**Ex 6.**  $P \times R \div Q$ , which of the following is true ?

- (A) P is uncle of Q (B) P is father of Q (C) P is brother of Q (D) P is son of Q

**Sol.** (D) R is the daughter of Q & P is brother of R,  $\therefore$  P is son of Q

**Ex 7.** If  $P \times R - Q$ , which of the following is true.

- (A) P is brother in law of Q (B) P is brother of Q  
(C) P is uncle of Q (D) P is father of Q

**Sol.** (A) Clearly, P is related as brother in law to Q.

**Ex 8.** Soni, who is Dubey's daughter, says to Preeti, "Your mother Shyama is the youngest sister of my father, Dubey's Father's third child is Prabhat". How is Prabhat related to Preeti ?

- (A) Uncle (B) Father (C) grandmother (D) Father in law

**Sol.** (A) Preeti's mother Shyama is youngest sister of Dubey & sister of Prabhat. Therefore Prabhat Preeti's uncle.

- Ex 9.** Pointing towards a man in the photograph, Archana said, "He is the son of the only son of my grandmother"/ How is man related to Archana ?  
(A) Cousin (B) Nephew (C) Brother (D) Son

**Sol.** (C) Only son of Archana's grandfather means Archana's father & his son is Archana's brother.

- Ex 10.** Pointing towards a woman in the photograph, Rajesh said "the only daughter of her grandfather (Paternal) is my wife". How is Rajesh related to that woman  
(A) Uncle (Fufa) (B) Father (C) Maternal uncle (D) Brother

**Sol.** (A) Rajesh is the husband of woman's father sister.

## PRACTICE EXERCISE

1. Akash said to Mohit, "That boy in blue shirt is younger of the two brothers of the daughter of my father's wife". How is the boy in blue shirt related To Aakash?  
(A) Father (B) Uncle (C) Brother (D) Nephew
2. Pointing to a person, Rohit said to Neha 'His mother is the only daughter of your father, "How is Neha related to that person ?  
(A) Aunt (B) Mother (C) Daughter (D) Wife
3. 'P + Q' means 'P is the brother of Q'. 'P - Q' means P is the mother of Q and 'P × Q' means 'P is the sister of Q'. Which of the following means that M is the maternal uncle of R ?  
(A) M - R + K (B) M + K - R (C) M + K × Q (D) None of these
4. 'A + B' means 'A is the son of B', 'A - B' means 'A is the wife of B'. 'A × B' means 'A is the brother of B', 'A ÷ B' means 'A is the mother of B', 'A = B' means 'A is the sister of B'. Which of the following represents P is the maternal - uncle of Q ?  
(A) R × P ÷ Q (B) P × R ÷ Q (C) P + R ÷ Q (D) P + R × Q
5. Amit said, "This girl is the wife of the grandson of my mother." How is amit related to the girl ?  
(A) Father (B) Father-in-law (C) Grandfather (D) Husband
6. Neelam, who is Rohit's daughter, says to Indu, "Your mother Reeta is the younger sister of my father, who is the third child of Sohanji. " How is Sohanji related to Indu ?  
(A) Maternal-uncle (B) Grandfather (C) Father (D) Father-in-law

7. Pointing to a girl in the photograph, Ramesh said "Her mother's brother is the only son of my mother's father". How is the girl's mother related to Ramesh ?  
(A) Mother (B) Sister (C) Aunt (D) Grandmother
8. Pointing to a man in a photograph, Anita said "His brother's father is the only son of my grandfather". How is the Anita related to the man in the photograph ?  
(A) Mother (B) Aunt (C) Sister (D) Daughter
9. Pointing to his son's portrait, a man said to a woman, "His mother is the only daughter of your mother". How was the woman related to the man ?  
(A) Sister (B) Mother (C) Wife (D) Daughter
10. Introducing a man, a woman said, "his wife is the only daughter of my father". How that man was related to the woman ?  
(A) Brother (B) Father-in-law (C) Maternal Uncle (D) Husband
11. If Anil is the brother of the son of Sunil's son, what is the relationship between Anil and Sunil ?  
(A) Cousin (B) Brother (C) Nephew (D) Grandson
12. Pointing to a person, a man said to a woman, "His mother is the only daughter of your father". How was the woman related to the person ?  
(A) Sister (B) Mother (C) Wife (D) Daughter

**Directions : (13 to 15), P, Q, R, S, T, U, V & W are the family members. Q is the sister of V and V is the brother of R. T is the wife of P, whose father is W. S is the husband of Q and U is the son of V. P is the father of Q.**

13. How U is related with T ?  
(A) Son (B) Mother (C) Grandson (D) Nephew
14. How S is related with R ?  
(A) Son (B) uncle (C) Son (D) Brother
15. How W is related with R ?  
(A) Grand father (B) uncle (C) Son (D) Brother

**Directions : (16 to 18) A, B, C, D, E & F are related to each other as given here. B is F's daughter-in-law. D is A's only grand child. C is D's only uncle. A has two children F and C, one male & one female (not necessarily in the same order). E is the Father of C.**

16. Who is the grand mother of D ?  
(A) B (B) A (C) C (D) D

17. Who is the mother-in-law of B ?  
(A) C (B) D (C) E (D) F
18. If a girl G is married into the family, what is the relationship between G and D ?  
(A) Mother (B) Aunt (C) Mother-in-law (D) Grand mother

**Directions : (19 to 22) Read the following information carefully and answer the questions given below :**  
**There are six children playing football namely A,B,C,D,E and F. A and E are brother. F is the sister of E. C is the only son of A's uncle. B and D are the daughters of the brother of C's father.**

19. How is C related to F ?  
(A) Cousin (B) Brother (C) Son (D) Uncle
20. How many male players are there ?  
(A) One (B) Three (C) Five (D) Six
21. How many female players are there ?  
(A) Two (B) Three (C) Five (D) One
22. How is related to A ?  
(A) Uncle (B) Sister (C) Niece (D) Cousin

**Directions : (23 to 28) Read to following information carefully and answer the questions given below it:**  
**A family consist of six members P,Q,R,X,Y and Z. Q is the son of R but R is not mother of Q. P and R are married couple. Y is the brother of R. X is the daughter of P. Z is the brother of P.**

23. Whose is the brother-in-law of R ?  
(A) P (B) Z (C) Y (D) X
24. Whose is the father of Q ?  
(A) R (B) P (C) Z (D) None of these
25. How many children does P have ?  
(A) One (B) Two (C) Three (D) Four
26. How many female numbers are there in the family ?  
(A) One (B) Two (C) Three (D) Four
27. How is Q related to X ?  
(A) Husband (B) Father (C) Brother (D) Uncle

28. Which is pair of brothers ?  
(A) P and X (B) P and Z (C) Q and X (D) R and Y

## ANSWERS

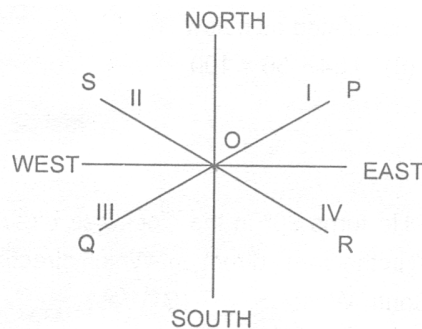
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Ans.	C	B	B	B	B	B	A	C	C	D	D	B	C	C
Que.	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Ans.	A	B	D	B	A	B	B	D	B	A	B	B	C	D



# DIRECTIONS SENSE TEST



There are four directions such as North, East and West. The word NEWS came from North, East, West and South. There are four regions : North-East (i); North-West (ii) ; South-East (iii) ; South - West (iv).



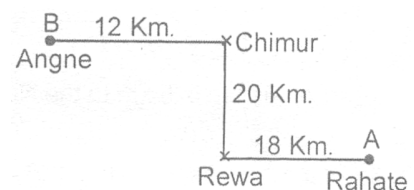
The directions OP, OS, OQ and OR are :

North - East direction ; North - West direction ; South - West direction ; and South-East direction respectively.

**NOTE :** The candidates must distinguish between the regions and directions, i.e., between North-East region and North-East direction. If you move with you face Eastwards, your left hand in towards North and your right hand in towards South. Similarly the positions of the directions of the hands can be fixed when you move in any of the other three directions.

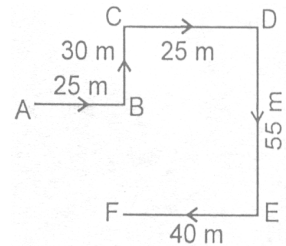
- Ex 1.** Village Chimur is 20 km to the North of village Rewa. Village Rahate is 18 km to the East of village Rewa. Village Angne is 12 km to the West of Chimur. If Sanjay starts from village Rehate and goes to village Angne, in which direction is he from his starting point ?  
 (A) North (B) North-West (C) South (D) South-East

**Sol.** (B) From the figure it is clear that A and B denote the starting and finishing points respectively. B is to the North-West of Point A.



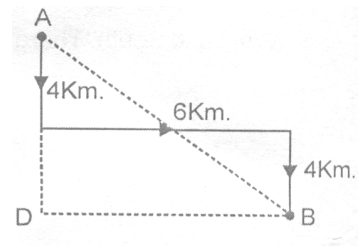
- Ex 2.** Amit faces towards North. Turning to his right he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point ?  
 (A) South-West (B) South (C) North-West (D) South-East

- Sol.** (D) Amit turns towards right from North direction. So he walks 25 m towards East upto B, turns left and moves 30 m upto C, turns right and moves 25m upto D. At D he turns to right towards the South and walks 55 m upto E. Next, he again turns to right and walks 40 m upto F, Which is his final position. F is to the South-East of A. So, he is to the South-East from his starting point.



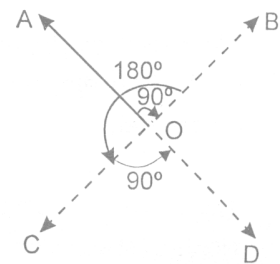
- Ex 3.** Ravi traveled 4 km straight towards south. He turned left and traveled 6 km straight, then turned right and traveled 4 km straight. How far is he from the starting point ?  
 (A) 8 km (B) 10 km (C) 12 km (D) 18 km

- Sol.** (B) B is the finishing point and is 10 km. from the point A. The aerial distance of A from B is 10 km, calculated as below  $(AB)^2 = (AD)^2 + (DB)^2 = (8)^2 + (6)^2 = 64 + 36 = 100$   
 $\therefore AB = 10$  km.



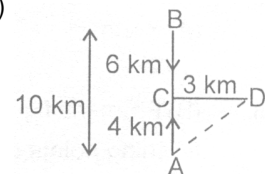
- Ex 4.** A man is facing North-West. He turns  $90^\circ$  in the clockwise direction, then  $180^\circ$  in the anticlockwise direction and then another  $90^\circ$  in the same direction. Which direction is he facing now ?  
 (A) South (B) South-West (C) West (D) South-East

- Sol.** (D) As shown in Fig. the man initially faces in the direction OA. On moving  $90^\circ$  clockwise, he faces in the direction OB. On further moving  $180^\circ$  anticlockwise, he faces in the direction OC. Finally of moving  $90^\circ$  anti-clockwise, he faces in the direction OD, which is south-East.



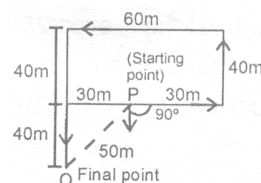
- Ex 5.** Kishen walks 10 km towards North. From there, he walks 6 km towards South. Then he walks 3 km towards East. How far and in which direction is he with reference to his starting point ?  
 (A) 5 km, North (B) 5 km, North-East (C) 7 km, East (D) 7 km, West

- Sol.** (B) The movements of Kishen are as shown in Fig. (A to B, B to C and C to D)  
 $\therefore AC = (AB - BC) = (10 - 6) \text{ km} = 4 \text{ km}$ . clearly, D is to the North-East of A.  
 $\therefore$  Kishen's distance from starting point  
 $A = AD = \sqrt{AC^2 + CD^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5 \text{ km}$ .  
 So, Kishen is 5 km to the North-East of his starting point.



- Ex 6.** I am facing south. I turn  $90^\circ$  in the anti-clockwise direction and walk 30 m and then Turing north I walk 40 m and then turning west I go 60 m. Then turning left walk 80 m. How far am I from the starting point ?  
 (A) 30 m (B) 40 m (C) 50 m (D) 210 m

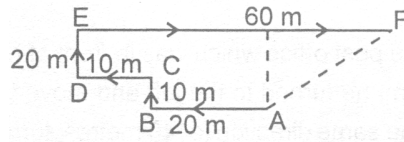
- Sol.** (C) According to the statement, Hence, the answer is 50 m





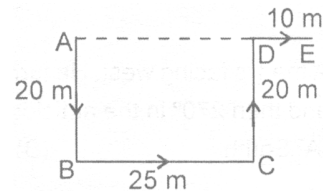
- Ex 7.** I am facing South. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point ?  
 (A) North (B) Northwest (C) East (D) Northeast

**Sol.** (D) The movements of the person are from A to F, as shown in fig. Clearly, the final position is F which is to the Northeast of the starting point A?



- Ex 8.** Raj walked 20 metres towards South. Then he turned to his left and walked 25 metres. He then turned to his left and walked 20 metres. He again turned to his right and walked 10 metres. At what distance is he from the starting point and in which direction ?  
 (A) 35 metres, East (B) 35 metres, North (C) 40 metres, East (D) 60 metres, East

**Sol.** (A) the movements of Raj are as shown in fig.  
 $\therefore$  Raj's distance from starting point A  
 $= AE = (AD + DE)$   
 $= (BC + DE) = (25 + 10) \text{ m} = 35 \text{ m}.$   
 So, E is to the East of A.



- Ex 9.** The town of Paranda is located of Green lake, The town of Akram is West of Paranda, Tokhada is East of Akram but West Paranda. Kokran is East of Bopri but West of Tokhada and Akram. If they are all in the same district, which town is the farthest West ?  
 (A) Paranda (B) Kokran (C) Akram (D) Bopri

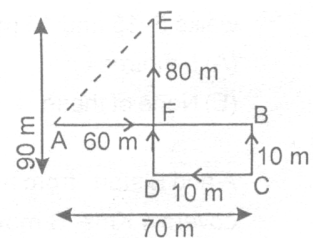
**Sol.** (D) Bopri is the farthest West



- Ex 10.** Sanjay went 70 metres in the East before turning to his right. He went 10 metres before turning to his right again and went 10 metres from this point. From here he went 90 metres to the North. How far was he from the starting point ?  
 (A) 80 metres (B) 100 metres (C) 140 metres (D) 260 metres

**Sol.** (B) The movement of Sanjay from A to E are as shown in fig.  
 Now,  $AF = (AB - FB)$   
 $= (AB - DC) = (70 - 10) \text{ m} = 60 \text{ m}.$   
 $EF = (DE - DF) = (DE - BC)$   
 $= (90 - 10) \text{ m} = 80 \text{ m}.$

$$\text{Required distance} = AE = \sqrt{AF^2 + EF^2} = \sqrt{(60)^2 + (80)^2} = 100 \text{ m} = 100 \text{ m}$$



## PRACTICE EXERCISE

- One evening before sunset two friends Amit and Sunit were talking to each other face to face. If Sunil's shadow was exactly to his left side, which direction was Amit facing.  
(A) North (B) South (C) West (D) Data inadequate
- A postman was returning to the post office which was in front of his to the North. When the post office was 100 metres away from him, he turned to the left and moved 50 metres to deliver the last letter at shantivilla. He then moved in the same direction for 40 metres, turned to his right and moved 100 metres. How many metres was he away from the post office ?  
(A) 0 (B) 90 (C) 150 (D) 100
- Two buses start from the opposite points of a main road, 150 kms apart. The first bus runs for 25 kms and takes a turn right and runs for 15 kms. It then turns left and runs for another 25 kms and takes the direction back to reach the main road, In the meantime, due to a minor breakdown, the other bus has run only 35 kms along the main road, What would be the distance between the two buses at this point ?  
(A) 75 kms (B) 80 kms (C) 65 kms (D) 85 kms
- A man is facing west. He turns  $45^\circ$  in the clockwise direction and then another  $180^\circ$  in the same direction and then  $270^\circ$  in the anticlockwise direction. Whish direction is he facing now ?  
(A) South (B) North-West (C) West (D) South-West
- A started from a place. After walking for a kilometer, he turns to the left, then walking for a half km. he again turns to left. Now, he is going Eastward direction. In which direction, did he originally start ?  
(A) West (B) East (C) South (D) North  
(E) None
- Form point P, Akshay starts walking towards East. After walking 30 metres, he turns to his right and walks 10 metres. he then turns to his right and walks for 30 metres. He again turns to his right and walks 30 metres. he again turns to his right and walks 30 metres. How far is he from Point P and in which direction ?  
(A) Point P itself (B) 10 metres North (C) 20 metres West (D) 20 Metres North  
(E) None
- A walks 10 metres towards East and then 10 metres to his right. Then every time turning to his left, he walks 5, 15 and 15 metres respectively. How far is he now from his starting point ?  
(A) 5 metres (B) 10 metres (C) 15 metres (D) 20 metres  
(E) None of these
- A and B start from a fixed point. A moves towards North and after walking 3 Kms turns to his right and covers 4 kms. B moves towards West and walks 5 Kms and then turns to his right and walks 3 Kms. Now how far are A and B from each other ?  
(A) 1 Kms (B) 5 Kms (C) 8 Kms (D) 9 Kms

9. A person starts towards South direction. Which of the following orders of directions will lead him to East direction ?  
(A) right, right, right (B) left, left, left (C) left, right, right (D) left, right, left
10. Amar travels one km due East : then 5 km due south, then 2 km due East and finally 9 km due North. How far is from the starting point ?  
(A) 16 kms. (B) 8 kms. (C) 6 kms. (D) 5 kms.
11. A man was facing East. he took Three paces forward, turned right, walked another two paces and then turned right again, took three paces and turned about. Which direction was he last facing ?  
(A) East (B) North (C) South (D) None of these
12. If I stand on my head with my face pointing Northwards, in what direction will my right-hand point >  
(A) East (B) West (C) North (D) South
13. Kumar stands with his face pointing to the South-East direction. He walked 15 metres and then turned Northwards and walked another 12 metres. How far was he then from the starting point ?  
(A) 12 metres (B) 10 metres (C) 9 metres (D) 5 metres
14. The time on the watch is quarter to three. If the minute-hand points to North-East, in which direction does the hour hand point?  
(A) South-West (B) South-East (C) North-West (D) North-East
15. A and B start walking from the same point. A goes North and covers 3 km ; then turns right and covers 4 km. B goes west and covers 5 km, then turns right and covers 3 kms. How far apart are they from each other?  
(A) 10 km (B) 9 km (C) 8 km (D) 5 km
16. A and B start walking in opposite directions. A walked 5 km, B 6 km. Thereafter both turned to their right and walked 2 km. They turned to right again and walked 3 km, again turned to right and walked 2 km. How much distant apart are they from each other ?  
(A) 2 km (B) 13 km (C) 3 km (D) 5 km
17. A watch reads 4 : 30. If the minute - hand points to East, in which direction does the hour-hand point ?  
(A) North-East (B) South-East (C) North-West (D) North
18. L is to South-West of K, M is to the East of L and South-East of K and N is to the North of M in line with LK. In which direction of K is N located ?  
(A) North (B) East (C) South-East (D) North-East
19. If South-East becomes North, North-East becomes West and so on, what will South become ?  
(A) North-East (B) South-West (C) South (D) Northwest
20. I run along the sides of a square field ABCD where C is to the North-East of A and D is to the South-East of B. Starting from A in anti-clockwise, in which direction shall I be running after crossing C ?  
(A) East (B) West (C) North (D) South

21. Shehnaz wants to go to the School. She starts from her home which is in North and comes to the crossing. The road to her left ends in a park and straight ahead is the office complex. In which direction is the School ?  
 (A) East (B) North (C) West (D) South

**Directions : (22 to 25 ) Read the following statements and choose the correct alternative.**

- (i) A is north of E and west of C.  
 (ii) B is north for A and west of F.  
 (iii) D is south and east of A.  
 (iv) E is north of F and east of D.  
 (v) F is north of D and west of A.  
 (vi) C is south of F and west of D.

22. Which of the towns is furthest to the north west ?  
 (A) A (B) B (C) C (D) E
23. Which of the following must be both north and east of F ?  
 I. A II. C III. E  
 (A) II only (B) III only (C) I and II (D) I and III
24. Which of the following towns must be situated both south and west of at least one other town ?  
 (A) A and E (B) A and F (C) B and F (D) C, D and E
25. Which of the following statements, if true, would make the information in the numbered statements more specific ?  
 (A) C is north of D (B) E is north of D (C) A is east of B (D) C is east of F

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	A	B	C	D	A	D	A	D	A	D	A	B	C
Que.	14	15	16	17	18	19	20	21	22	23	24	25	
Ans.	A	B	D	A	D	A	B	C	B	D	B	A	



# ANALOGY



**Analogy** means ‘Similarity’. A particular relationship is given and another similar relationship has to be identified from the alternatives provided.

## KINDS OF RELATIONSHIPS :

### Study & Topic Relationship :

#### Some examples :

- |                              |  |                                     |
|------------------------------|--|-------------------------------------|
| 1. Botany : Study of Plants  | 2. Zoology : Animals                           | 3. Seismology : Earthquakes         |
| 4. Astrology : Future        | 5. Pathology : Diseases                        | 6. Cardiology : Heart               |
| 7. Astronomy : Planets       | 8. Tectonics : Building                        | 9. Taxidermy : Stuffing (Animals)   |
| 10. Penology : Punishment    | 11. Cytology : Cells                           | 12. Geology : Earth                 |
| 13. Archaeology : Artifacts  | 14. Ecology : Environment                      | 15. Anthology : Collection of Poems |
| 16. Trigonometry : Triangles | 17. Mensuration : Area                         | 18. Ornithology : Birds             |
| 19. Onomatology : Names      | 20. Ontology : Reality<br>(Anthropology : Man) | 21. Ethnology : Human Races         |
| 22. Herpetology : Amphibians | 25. Semantics : Language                       | 23. Paleography : Writings          |
| 24. Ichthyology : Fish (es)  | 28. Hematology : Blood                         | 26. Nephrology : Kidney             |
| 27. Conchology : Shells      | 31. Virology : Viruses                         | 29. Mycology : Fungi                |
| 30. Oology : Eggs            | 33. Occultism Supernatural                     | 32. Craniology : Skill              |
| 33. Entomology : Insects     | 36. Penology : Soil                            | 34. Malacology : Molluscs           |
| 35. Paleontology : Fossils   | 39. Stenography : Moon                         | 37. Taxonomy : Classification       |
| 38. Orography : Mountains    | 42. Nidology : Nests                           | 40. Eccrinology : Secretions        |
| 41. Histology : Tissues      |  | 43. Physiology : Algae              |
| 44. Bryology : Bryophytes    |  |                                     |

### Workers & Tool Relationship :

**Ex.** Laborer : Spade  
Spade is a tool used by a Laborer.  
Some more examples -

- |                            |                        |                          |
|----------------------------|------------------------|--------------------------|
| 1. Carpenter : Saw         | 2. Wood cutter : Axe   | 3. Blacksmith : Anvil    |
| 4. Soldier : Gun           | 5. Tailor : Needle     | 6. Chef : Knife          |
| 7. Farmer : Plough         | 6. Author : Pen        | 9. Warrior : Sword       |
| 10. Sculptor : Chisel      | 11. Mason : Plumb line | 12. Doctor : Stethoscope |
| 13. Gardener : Harrow      | 14. Surgeon : Scalpel  | 15. Cobbler : Awl        |
| 16. Lumberjack : Axe       | 17. Painter : Brush    | 18. Violinist : Bow      |
| 19. Barber : Scissors      | 20. Butcher : Chopper  |                          |
| 21. Astronomer : Telescope | 22. Jockey : Tack      |                          |

**Tool & Action Relationship :****Ex.** Needle : Saw

A needle is used for sewing ?

1. Knife : Cut

4. Microscope : Magnify

7. Filter : Purity

10. Steering : Drive

13. Axe : Grind

16. Auger : Bore

2. Gun : Short

5. Spanner : Grip

8. Spade : Dig

11. Spoon : Feed

14. Shield : Guard

17. Oar : Row

3. Pen : Write

6. Sword : Slaughter

9. Mattock : Dig

12. Chisel : Carve

15. Loudspeaker : Amplify

18. Shovel : Scoop

**Worker and Working place:****Ex.** Chef : Kitchen

Chef works in a kitchen

1. Farmer : Field

4. Sailor : Ship

7. Actor : Stage

10. Scientist : Laboratory

13. Servant : House

16. Teacher : School

19. Clerk : Office

22. Grocer : Shop

2. Warrior : Battle field

5. Pilot : Cockpit

8. Mechanic : Garage

11. Waiter : Restaurant

14. Worker : Factory

17. Artist : Theatre

20. Driver : Cabin

3. Engineer : Site

6. Beautician : Parlor

9. Lawyer : Court

12. Gambler : Casino

15. Umpire : Pitch

18. Doctor : Hospital

21. Painter : Gallery

**Workers & Product :****Ex.** Poet : Poem

Poet writes poem:

**Ex.** Chef : Food

Chef makes food

1. Farmer : Crop

4. Cobbler : Shoes

7. Carpenter : Meat

10. Producer : Film

13. Dramatist : Play

16. Mason : Wall

2. Author : Book

5. Editor : Newspaper

8. Butcher : Meat

11. Architect : Design

14. Choreographer : Ballet

3. Gold Smith : Ornaments

6. Hunter : Prey

9. Judge : Justice

12. Tailor : Clothes

15. Teacher : Educations

**Product and Raw Material :****Ex.** Cloth : Fiber (Cloth is made of Fiber)

1. Paper : Pulp

4. Oil : Seed

7. Metal : Ore

10. Furniture : Wood

13. Omelets : Egg

16. Shoes : Leather

19. Jaggery : Sugarcane

2. Book : Paper

3. Road : Asphalt

8. Fabric : Yarn

11. Butter : Milk

14. Rubber : Latex

17. Prism : Glass

3. Jewellery : Gold

6. Sack : Jute

9. Pullover : Wool

12. Wine : Grapes

15. Wall : Brick

18. Linen : Flax

**Instrument & Measurement :****Ex.** Ammeter : Current

1. Scale : length Scale in an Instrument used to measure length.

2. Balance : Mass

3. Thermometer : Temperature.

4. Odometer : Speed

5. Hygrometer : Humidity

6. Screw gauge : Thickness

7. Seismograph : Earthquake

8. Anemometer : Wind vane

9. Taseometer : Strains

10. Rainguage : Rain

11. Barometer : Pressure

12. Sphygmomanometer : Blood Pressure

**Quantity & Unit****Ex.** Time : Seconds

Seconds is the unit of Time :

1. Force: Newton

2. Length : Meter

3. Energy : Joule

4. Work : Joule

5. Current : Ampere

6. Volume : Litre

7. Power : Watt

8. Potential : Volt

9. Mass : Kilogram

10. Pressure : Pascal

11. Area : Hectare

12. Temperature : Degrees

13. Resistance : Ohm

14. Angle : Radians

15. Magnetic field : Oersted

16. Conductivity : Mho

17. Luminosity : Candela

**Animal & Young ones :****Ex.** Dog : Puppy (Puppy is the young one of Dog)

1. Lion : Cub

2. Man : Child

3. Hen : Chicken

4. Sheep : Lamb

5. Cow : Calf

6. Cat : Kitten

7. Duck : Duckling

8. Horse : Pony/Calf

9. Insect : Larva

10. Station : Colt

11. Butterfly : Caterpillar

12. Frog : Tadpole

13. Pig : Farrow

14. Tortoise : Turtle

**Male & Female :****Ex .** Tiger : Tigress

Tigress is Female tiger

1. Son : Daughter

2. Gentleman : Lady

3. Nephew : Niece

4. Drone : Bee

5. Dog : Bitch

6. Stage : Doe

7. Sorcerer : Sorceress

8. Horse : Mare

9. Lion : Lioness

**Word & Synonym :****Ex.** Vacant : Empty (Empty means almost the same as Vacant)

1. Substitute : Replace

2. Blend : Mix

3. House : Home

4. Solicit : Request

5. Flew : Defect

6. Fierce : Violent

7. Dearth : Scarcity

8. Ban : Prohibition

9. Mend : Repair

10. Assign : Allot

11. Abduct : Kidnap

12. Sedate : Calm

13. Alight : Descent

14. Pressure : Assume

15. Presage : Predict

16. Fallacy : Illusion

17. Brim : Edge

18. Dissipate : Squander

19. Haughty : Proud

20. Dissipate : Squander

**Word & Antonym :**

**Ex.** Good : Bad

- |                     |                               |                         |
|---------------------|-------------------------------|-------------------------|
| 1. Cruel : Kind     | 2. Best : Worst               | 3. Sink : Float         |
| 4. Strong : Weak    | 5. Initial : Final            | 6. Start : End          |
| 7. Ignore : Notice  | 8. Advance : Retreat          | 9. Create : Destroy     |
| 10. Gentle : Harsh  | 11. Gradual : Abrupt (Sudden) | 12. Condense : Expand   |
| 13. Deep : Shallow  | 14. Affirm : Deny             | 15. Kindle : Extinguish |
| 16. Mourn : Rejoice | 17. Cordial : Hostile         | 18. Kindle : Extinguish |
| 19. Chaos : Peace   | 20. Fresh : Stale             | 21. Lend : Borrow       |

**Words & Intensity :**

**Ex.** Quarrel : War

- |                    |                  |                      |
|--------------------|------------------|----------------------|
| 1. Anger : Rage    | 2. Kindle : Burn | 3. Error : Blunder   |
| 4. Wish : Desire   | 5. Sink : Drown  | 6. Famous : Renowned |
| 7. Unhappy : Sad   | 8. Crime : Sin   | 9. Refuse : Deny     |
| 10. Moist : Drench |                  |                      |

**SIMPLE ANALOGY :**

**Directions : (1 to 3) In the following questions, choose the words that show the same relationship as given in the each questions.**

**Ex 1.** Flower is to a Bouquet as Minister is to a.

- (A) Voter (B) Cabinet (C) Constituency (D) Department

**Sol.** (B) Second word **Bouquet** is group of first word **Flower**. In the same manner **Cabinet** is a group of **Ministers**.

**Ex 2.** Hour is related to Second in the same way as Tertiary is related to.

- (A) Ordinary (B) Secondary (C) Primary (D) Intermediary

**Sol.** (C) **Second** is the third position after **Hour** in time measurement. Likewise **Tertiary** is the third position after **Primary** in the order of ranking.

**Ex 3.** Sports is related to Logo in the same way as Nation is related to.

- (A) Emblem (B) Animal (C) Ruler (D) Anthem

**Sol.** (A) The symbol **Logo** is related to **Sports**. Likewise **Emblem** is related to **Nation**.



### LETTER ANALOGY :

In letter analogy questions, the question pair and answer pair consists of letters. You have to examine the questions pair and find the relationship between them and choose the answer pair that contains the same analogy or relationship as in the questions pair.

**Directions : (4 to 13) In each of the following questions, there are two terms to the left of the sign :: which are related in some way. Obtain the same relationship between the term to the right of the sign :: from one of the four alternatives gives under it.**

**Ex 4.** ef : jk :: no : ?

- (A) dc (B) gi (C) ml (D) tu

**Sol.** (D) In the questions pair 'ef : jk'. The letters of the first term 'ef' are in natural alphabetic sequence. So is the second term 'jk'. The letter 'no' are also in the natural alphabetic sequence.

**Ex 5.** FG : LM :: ? : ?

- (A) NO : TU (B) HI : RS (C) GH : KL (D) DE : BA

**Sol.** (A) Examine the questions pair 'FG : LM'. The relationship is that the letters are in alphabetic order and five letters are skipped between terms.

**Ex 6.** LXNU : NYPV :: QTBR : ?

- (A) RUSD (B) SDSU (C) SUDS (D) RSUD

**Sol.** (C) Second term is obtained from the first by moving its first and third letters two steps forward while the second and fourth letters one step forward.

**Ex 7.** MANTEL : NAMLET :: VANITY : ?

- (A) NAVYIT (B) NAVYTI (C) NAVIYI (D) AVNTIY

**Sol.** (B) Group of three letters is reversed.

**Ex 8.** TUESDAY : UUFSCAX :: SQUAREE : ?

- (A) TQUASED (B) TQVASED (C) TQVAQED (D) TXVARED

**Sol.** (C) Sequence is + 1, 0, + 1, 0, - 1, 0, -1

**Ex 9.** AEZ : EIY :: IOX : ?

- (A) UYZ (B) AEX (C) EIX (D) OUW

**Sol.** (D) Each term has two vowels in the beginning, and the first letter from backward sequence. Hence AE (vowels) Z, EI (vowels) Y etc.

**Ex 10.** ECF : EDG :: IEH : ?

- (A) OFJ (B) OFI (C) GHI (D) LMN

**Sol.** (B) Each item starts with a vowel which maintains the sequence of AEIOU as is seen from other items. After a vowel, 2 letters follow, of which 2 intervening consecutive letters are skipped, i.e. C (DE) F, D (EF) G, E (FG) H and F (GH) I.

**Ex 11.** CG : EI :: FJ : ?

(A) JK

(B) IJ

(C) LM

(D) GK

**Sol.** (D) Letter groups consist of 2 letters in alphabetic order skipping 3 letters immediately following.

**Ex 12.** DFHJ : LNPR :: ? : BDFH

(A) VXZT

(B) UVXZ

(C) TXVZ

(D) TVXZ

**Sol.** (D) All the letters of the second term are moved eight steps backward to obtain the first term.

**Ex 13.** DULC : EVMD :: ? : GXOF

(A) FQNE

(B) HNWE

(C) HWNE

(D) FUEN

**Sol.** (A) First term is obtained from the second by moving all its letters one step backward.

### WORD ANALOGY :

**Ex 14.** India Gate : Delhi :: \_\_\_\_\_ :

(A) Chicago : USA

(B) Albany : New York

(C) Agra : Taj Mahal

(D) Chandigarh : Rock Garden

**Sol.** (B) India Gate is in Delhi, Albany is in New York.

**Ex 15.** PUNJAB : AMRITSAR :: \_\_\_\_\_ :

(A) Golden Temple : Amritsar

(B) Moscow : Russia

(C) India : Asia

(D) Agra : Taj Mahal

**Sol.** (D) Amritsar is in Punjab , Taj Mahal is in Agra

**Directions : (16)** In each of following questions, two words indicated by I and II have been left out. The correct word to come in place of I is given as one of the four alternatives against I and the correct word to come in place of II is given as one of the four alternatives against II. Read with the correct words, there is some relationship between the two words to the left of the sign (: :) and the same relationship obtains between the two words to the right of the sign (: :) The correct combination is given as one of the four alternatives (a), (b), (c) and (d). Find the correct combination in each case.

**Ex 16.** I : Melt :: Bright : II

I. (a) Liquid (b) Ice (c) Heat (d) Freeze

II. (P) Dull (Q) Dazzle (R) Light (S) Colour

(A) as (B) bR (C) cQ (D) dP

**Sol.** (D) The words in each pair are antonyms of each other.

**Directions : (17 to 18)** In each of the following questions, a group of three interrelated words is given. Choose a word from the given alternatives, that belongs to the same group.

**Ex 17.** Marble : Slat : Gneiss

(A) Quartzite

(B) Limestone

(C) Coal

(D) Sandstone

**Sol.** (A) All are metamorphic rocks.

**Ex 18.** Pituitary : Thyroid : Pancreas

- (A) Adrenal (B) Heart (C) Liver (D) Kidney

**Sol.** (A) All are endocrine glands.

**Directions: (19 to 20) Three words in bold letters are given in each questions, which have something in common among themselves. Out of the four given alternatives, Chooses the most appropriate description about these three words.**

**Ex 19.** Analects : Zend Avesta : Torah

- (A) These are places of worship (B) These are three sects of Muslims  
(C) These are names of religions (D) These are names of religious books.

**Ans.** (D)

**Ex 20.** Hiss : Hoot : Trumpet

- (A) They are sounds made by certain creatures  
(B) They are joyous cries of children  
(C) They are sounds made by war-instruments.  
(D) The terms are used in connection with under-word activities.

**Ans.** (A)

### NUMBER ANALOGY :

**Directions : (21 to 23) In each of the following questions, there is a certain relation between two given number 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 relation with this number as the numbers of the given pair bear. Choose the best alternative.**

**Ex 21.** 7584 : 4251 :: 4673 ?

- (A) 1367 (B) 1340 (C) 1531 (D) None of these

**Sol.** (B) The relationship is  $x : (x - 3333)$

**Ex 22.** 225 : 257 :: 289 : ?

- (A) 301 (B) 316 (C) 320 (D) 325

**Sol.** (D) The relationship is  $x^2 : (x + 1)^2 + 1$

**Ex 23.** 5 : 18

- (A) 30 : 96 (B) 21 : 66 (C) 19 : 61 (D) 11 : 35

**Sol.** (B) The relationship is  $x : (3x + 3)$

**Directions :** (24 to 26) In each of the following questions, choose one number which is similar to the number is the given set.

**Ex 24.** Given set : 192, 282, 372

- (A) 453 (B) 461 (C) 236 (D) 425

**Sol.** (A) In all the numbers, the sum of digits is 12 and the largest digit lies in the middle.

**Ex 25.** Given set : (8, 15, 24)

- (A) (6, 13, 21) (B) (10, 17, 28) (C) (11, 18, 27) (D) (13, 20, 32)

**Sol.** (C) In each set, 2nd number = 1st number + 7 ; 3rd number = 2nd number + 9.

**Ex 26.** Given Set : (8, 3, 2)

- (A) (10, 6, 5) (B) (63, 8, 3) (C) (95, 24, 5) (D) (168, 15, 4)

**Sol.** (B) In each set, 1<sup>st</sup> number = (2nd number)<sup>2</sup> - 1 ; 2nd number = (3rd number)<sup>2</sup> - 1.

## PRACTICE EXERCISE

**Direction ; (1 to 7) In the following questions, choose the words that show the same relationship as given in the each questions.**

- Bank** is related to **Money** in the same way as **Transport** is related  
(A) Goods (B) Road (C) Terrace (D) Floor
- What is related to **Taka** in the same way as **Lira** is related to **Italy** ?  
(A) Pakistan (B) Jordan (C) Mexico (D) Bangladesh
- Needle** is related to **Clock** as **Wheel** is related to \_\_\_\_\_  
(A) Drive (B) Vehicle (C) Circular (D) Move
- Disease** is related to **pathology** in the same way as **Planet** is related to  
(A) Sun (B) Satellite (C) Astrology (D) Astronomy
- Boat** is related to **Oar** in the same way as **Bicycle** is related to  
(A) Road (B) Wheel (C) Seat (D) Paddle

6. **Match** is related to **Win** in the same way as **Examination** is related to  
(A) Write (B) Appear (C) Success (D) Attempt
7. **Heart** is related to **Blood** in the same way as **Lung** is related to  
(A) Oxygen (B) Chest (C) Purification (D) Air

**Direction : (8 to 15) In each of the following questions, there are two terms to the left of the sign :: which are related in some way. Obtain the same relationship between the term to the right of the sign :: from one of the four alternatives given under it.**

8. ? : CEIG :: LNRP : OKUM  
(A) FELD (B) ZHFJ (C) FHFJ (D) ABLD
9. KLQM : CFMK :: NRPT : ?  
(A) FLLR (B) HIJH (C) FLTM (D) RLTM
10. LJPN : KMOQ :: > : XVTZ  
(A) YSUV (B) SVWY (C) VTWY (D) YSUW
11. APOC : ? :: ITSK : MVUN  
(A) DRQH (B) ERQF (C) EQRG (D) DQRH
12. AZB : BYC :: CXD : ?  
(A) DWE (B) DEF (C) DFG (D) DMN
13. ABCD : WXYZ :: EFGH ::  
(A) STUV (B) TSUV (C) STUE (D) STVU
14. JTIS : HRGQ :: FPEO : ?  
(A) DCNQ (B) CNDM (C) CNDQ (D) DNCM
15. ACEG : ? :: BDFH : KMOQ  
(A) LMNO (B) JLNP (C) JNLO (D) JLON

**Directions: (16 to 17) In each of the following questions, two words indicated by I and II have been left out.**

**The correct word to come in place of I is given as one of the four alternatives against I and the correct words to come in place of II is given as one of the four alternatives against II. Read with the correct words, there is some relationship between the two words to the left of the sign (: :) and the same relationship obtains between the two words to the right of the sign (: :). The correct combination is given as one of the four alternatives (A), (B), (C) and (D). Find the correct combination in each case.**

**16.** I : Water : : Thermometer : II

I. (a) Humidity (b) Rain (c) Pitcher (d) Evaporation

II. (P) Temperature (Q) Mercury (R) Doctor (S) Fever

(A) aS (B) cQ (C) dP (D) bR

**17.** I : Flower : : Miky way : II

I. (a) Garden (b) Plant (c) Fruit (d) petals

II. (P) Galaxy (Q) Star (R) Sky (S) Planet

(A) bP (B) dR (C) aQ (D) cS

**Direction : (18) Question consists of a pair of number that have a certain relationship to 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.**

**18.** 11 : 1210

(A) 6 : 216 (B) 7 : 1029 (C) 8 : 448 (D) 9 : 729

**Direction : (19) Question consist of particular pattern. Find that pattern and answer the question.**

**19** Given set : 992, 733, 845, 632

(A) 114 (B) 326 (C) 425 (D) 236

**Direction : (20) In each of the following questions, choose that set of numbers from the alternative sets. That is similar to the given set ?**

**20.** Given set : (246, 257, 358)

(A) (144, 235, 325) (B) (143, 253, 246) (C) (273, 365, 367) (D) (233, 343, 345)

**Directions : (21 to 23) In each of the following questions, a group of three interrelated words is given. Choose a word from the given alternatives, that belongs to the same group.**

**21.** Potato : Carrot : Reddish

(A) Tomato (B) Spinach (C) Sesame (D) Groundnut

22. Basket : Pail : Pan  
(A) Spoon (B) Bowl (C) Fork (D) Knife
23. Botany : Zoology : Cardiology  
(A) Morphology (B) Seismology (C) Pedology (D) Taxonomy

**Directions : (24 to 25) Three words in bold letters are given in each question, which have something in common among themselves. Out of the four given alternatives, choose the most appropriate description about these three words.**

24. Spinach : Fenugreek : Celery  
(A) These are cactus plant (B) These are wild flowers  
(C) These are wild plants (D) These are leafy vegetables
25. Petrol : Phosphorus : Cooking gas  
(A) They are fuels (B) They are highly inflammable  
(C) They can't be sold without permit (D) India has to import them

**Directions : (26 to 32) In the following question, choose the pair/group of words that show the same relationship as given at the top of every pair/group.**

26. Manger : Cabin  
(A) Driver : Train (B) Captain : Desk (C) Pilot : Cockpit (D) Servant : Hospital
27. Aeroplane : Hanger  
(A) Train : yard (B) Train : Plant form (C) Train : Rail (D) Train : Railway station
28. Engineer : Machine  
(A) Doctor : Disease (B) Doctor : Medicine (C) Doctor : Hospital (D) Doctor : Body
29. Mosquito : Malaria : :  
(A) Tobacco : Cancer (B) Road : Accident (C) Housefly : Food (D) Soil : Erosion
30. Light : Ray : : Sound ?  
(A) Hear (B) Wave (C) Audio (D) Pitch
31. Paisa - Rupee, Centimetre - Metre, Kilogram - ?  
(A) Metric tonne (B) Hectogram (C) Quintal (D) Gram
32. Water : Oxygen  
(A) Helium : Nitrogen (B) Salt : Sodium (C) Tree : Plant (D) Food : Hunger

**Directions :** (33 to 34) Find out the correct words from the options to fill in the blanks. The word which is in some way related to the word on the right as well as to the word on its left is the correct answer.

33. Medicine \_\_\_\_\_ spacecraft  
(A) Effective (B) Advanced (C) Capsule (D) Homeopathy
34. Money \_\_\_\_ River  
(A) Flow (B) Liquid (C) Dam (D) Bank

## ANSWERS

Que	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ans.	A	D	B	D	D	C	A	B	A	D	B	A	A	D	B	B	C
Que.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Ans.	C	C	C	D	B	A	D	B	C	A	D	A	B	C	B	B	D





## ➤ ➤ CLASSIFICATION ⬅ ⬅

### CLASSIFICATION :

**Classification** means 'to assort the items of a given group on the basis of certain common quality they possess and then spot the stranger out'.

**Directions : (1 to 5) In each of the following questions, five words are given, out of which four are same in one way and the fifth one is different from others. Select the odd one.**

**Ex 1.** (A) Sun (B) Moon (C) Venus (D) mars  
(E) Earth

**Sol.** (B) All the terms except **Moon** are related to the Solar system.

**Ex 2.** (A) Green (B) Violet (C) Brown (D) Yellow  
(E) Orange

**Sol.** (C) Except **Brown** all the colours are present in the rainbow.

**Ex 3.** (A) Silk (B) Fur (C) Milk (D) leather  
(E) Rubber

**Sol.** (E) Only **Rubber** is the tree product.

**Ex 4.** (A) Milk (B) Syrup (C) Squash (D) Tea  
(E) Cake

**Sol.** (E) All others are the drinks.

**Ex 5.** (A) Conscience (B) Morality (C) Conduct (D) Will-power  
(E) Weight

**Sol.** (E) All other terms are used to represent human behavioral personality factors.

**Directions : (6 to 9) In each of the following questions four out of five alternatives contain alphabet placed in a particular form. Find the one that does not belong to the group.**

**Ex 6.** (A) NKMJ (B) FCEB (C) URTQ (D) KHJG  
(E) TQRP

**Sol.** (E) In all other groups there is a gap of one letter as in the alphabet between second and third letter.

**Ex 7.** (A) DW (B) GT (C) KP (D) FR  
(E) HS

**Sol.** (D) In all other pairs of words first and second letters are equidistant from the beginning and end respectively in the alphabetical series.

**Ex 8.** (A) A8C (B) D22G (C) H42M (D) B36P  
(E) F34J

**Sol.** (E) In all other groups number between first and second letter is twice the sum of positions of first and last letters in the alphabet.

**Ex 9.** (A) KQ14 (B) AY13 (C) MR11 (D) GQ15  
(E) LZ19

**Sol.** (C) In all other groups number at the end is half of the positions of sum of first and second letters in the alphabet.

**Directions : (10 to 14) In the following questions, numbers given in four out of the five alternatives have some relationship. You have to choose the one which does not belong to the group.**

**Ex 10.** (A) 3 : 8 (B) 6 : 35 (C) 7 : 50 (D) 1 : 0  
(E) 9 : 80

**Sol.** (C) In other numbers second number is one less than the square of first number.

**Ex 11.** (A) 21 : 24 (B) 28 : 32 (C) 14 : 16 (D) 70 : 80  
(E) 54 : 62

**Sol.** (E) The ratio among the numbers is 7 : 8

**Ex 12.** (A) 4 (B) 8 (C) 16 (D) 9  
(E) 25

**Sol.** (B) All other numbers are square of natural numbers.

**Ex 13.** (A) 22 : 0 (B) 24 : 13 (C) 23 : 5 (D) 8 : 63  
(E) 24 : 18

**Sol.** (E) Second number is the difference of the square of digits of first number.

**Ex 14.** (A) 43 (B) 53 (C) 63 (D) 73  
(E) 83

**Sol.** (C) All other numbers are prime numbers.

## PRACTICE EXERCISE

**Directions : (1 to 28) In the following questions, three out of the four alternatives are same in a certain way and so form a group. Find the odd one that does not belong to the group.**

1. (A) Gold (B) Silver (C) Bronze (D) Iron
2. (A) Yen (B) Lira (C) Dollar (D) Ounce
3. (A) Huge (B) Tiny (C) Heavy (D) Small
4. (A) Teeth (B) Tongue (C) Palate (D) Chin
5. (A) Silk (B) Cotton (C) Nylon (D) Wool
6. (A) Triangle (B) Tangent (C) Square (D) Rhombus
7. (A) Drama (B) Story (C) Poem (D) Novel
8. (A) Lion-Deer (B) Cat-Mouse (C) Hawk-Pigeon (D) Pig-Piglet
9. (A) Work-Leisure (B) Day-Night  
(C) Expedite-Procrastinate (D) Frequently-Always
10. (A) April (B) May (C) July (D) September
11. (A) Few (B) Some (C) Most (D) All
12. (A) BF (B) HFK (C) NLP (D) XVZ
13. (A) MrW (B) ChN (C) KpU (D) BgL
14. (A) DFHB (B) KMOJ (C) PRTN (D) XZBV
15. (A) ROQP (B) KHJI (C) VSUT (D) JHIG
16. (A) ACE (B) MOQ (C) RTV (D) UWY
17. (A) BDI (B) KMR (C) PRW (D) FHN

18. (A) 232 (B) 362 (C) 661 (D) 264
19. (A) 426 (B) 369 (C) 279 (D) 159
20. (A) 488 (B) 929 (C) 776 (D) 667
21. (A) 6 : 18 (B) 2 : 2 (C) 8 : 32 (D) 4 : 12
22. (A) 9 : 80 (B) 1 : 0 (C) 12 : 143 (D) 10 : 91
23. (A) 4, 6, 10, 7 (B) 4, 12, 20, 28 (C) 1, 3, 5, 7 (D) 2, 6, 10, 14
24. (A) 22 : 44 (B) 39 : 981 (C) 45 : 1625 (D) 24 : 464
25. (A) 22 : 8 (B) 91 : 82 (C) 32 : 12 (D) 14 : 17
26. (A) 385 (B) 572 (C) 671 (D) 427
27. (A) 27 (B) 125 (C) 1321 (D) 729
28. (A) 9 - 27 (B) 15 - 45 (C) 10 - 30 (D) 20 - 60

## ANSWERS

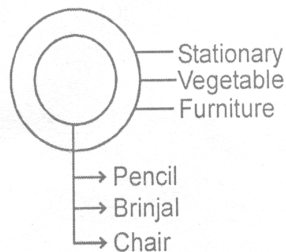
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Ans.	C	D	C	D	C	B	C	D	D	A	D	B	B	B
Que.	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Ans.	D	C	D	A	D	D	D	D	A	D	C	D	C	A



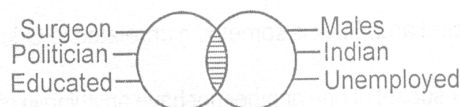
# LOGICAL VENN DIAGRAM



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 relationship can be represented by figure below -



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



All the three relationship 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 figure above.

3. Two objects are said to be disjoint when neither one is a 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



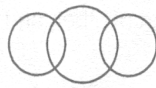
It is clear from the above relationship that both the objects are unrelated to each other, and hence can be represented diagrammatically as shown in figure above.

From the above discussing 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.

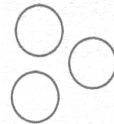
**Directions : (1 to 4) Each of these questions given below contains three group for this. You are to choose from the following five numbered diagrams a diagram that depicts the correct relationship among the three groups of thing in each question.**



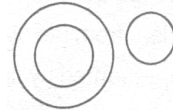
(A)



(B)



(C)



(D)

**Ex 1.** Moon, Earth, Universe

**Ex 2.** India, Pakistan, Asia

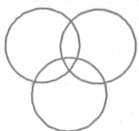
**Ex 3.** Batsman, Cricket, Stick

**Ex 4.** Book, Pen, Pencil

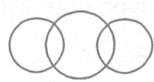
**Sol. (1 to 4) :**

1. Moon and Earth, are the parts of universe and therefore are subsets of universe and hence this relationship is represented by diagram (A).
2. India and Pakistan are the subsets of Asia. Hence, option (A) represents this relationship.
3. Batsman, is a subset of Cricket and, Stick is something unrelated to Cricket, therefore, our answer is (D).
4. Book, Pen, Pencil are neither subset of one another nor have anything in common. Therefore, our answer is (C).

**Ex 5.** Which of the following diagrams correctly represents the relationship among Tennis fans, Cricket players and Students.



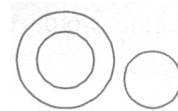
(A)



(B)



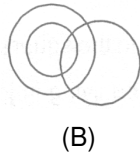
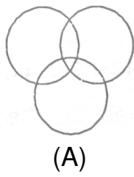
(C)



(D)

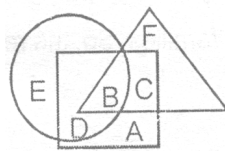
**Sol.** (A) From the relationship given in the question, we observe that each of the objects carries something in common to one another. A Tennis fan can be a cricket player as well as student. hence Diagram (A) represents this relationship.

**Ex 6.** Which of the following diagrams correctly represents the relationship among smokers, bidi smoker's cancer patients.



**Sol.** (B) Bidi smokers is a subset of smokers and cancer patient may be a smokers, bidi smoker and non-smoker. Hence third shares a common relationship with first and second object as well.

**Directions L (7 to 12)** In the following diagram three classes of population are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.



**Ex 7.** Married persons living in joint families but not working as school teachers are represented by  
 (A) C (B) F (C) D (D) A

**Ex 8.** Persons who live in joint families, are unmarried and who do not work as school teachers are represented by  
 (A) C (B) B (C) E (D) D

**Ex 9.** Married teachers living in joint families are represented by  
 (A) C (B) B (C) D (D) A

**Ex 10.** School teachers who are married but do not live in joint families are represented by  
 (A) C (B) F (C) A (D) D

**Ex 11.** School teachers who are neither married nor do live in joint families are represented by  
 (A) F (B) C (C) B (D) A

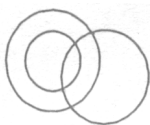
**Sol.** (7 to 11)

7. (C) Married persons living in joint families are presented by the region common to the square and the circle i.e., D and B. But, according to the given conditions, the persons should not be school teachers. So, B is to be excluded. Hence, the required condition is denoted by region D.

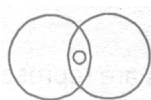
8. (C) Persons living in joint families are represented by the circle. According to the given conditions, the persons should be unmarried and not working as school teachers. So, the regions should not be a part of either the square or the triangle. Thus, the given conditions are satisfied by the region E.
9. (B) Married teachers are represented by the region common to the square and the triangle i.e., B and C. But, according to the given conditions, the persons should be living in joint families. So, the required region should be a part of the circle. Since B lies inside the circle, so the given conditions are satisfied by the persons denoted by the region B.
10. (A) As in the above question, married teachers are represented by B and C. But, here, the given conditions lay down that the persons should not be living in joint families. So, the required regions should lie outside the circle. Since C lies outside the circle, so the given conditions are satisfied by the persons denoted by the region C.
11. (A) School teachers are represented by the triangle. But according to the given conditions, persons are neither married nor do they live in joint families. So, the region should not be a part of either the square or the circle. Such a region is F.

## PRACTICE EXERCISE

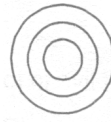
**Directions : (1 to 2) Each question below has three items having certain relationship among them. The same relationship is expressed by sets of circles, each circle representing one item irrespective of its size. Match the items with right set of circles.**



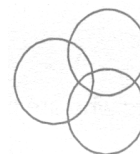
(A)



(B)



(C)



(D)

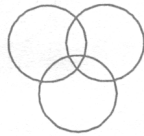
1. Women, Married persons, Wives who work.  
 (A) A (B) C (C) D (D) B
2. Computer skilled, Graduates, Employed.  
 (A) C (B) D (C) B (D) A



**Directions : (3 to 4) Out of the four alternatives in each of the following questions, three alternatives are such that the three words in each are related among themselves in one the five ways represented by (A), (B), (C), (D) and (E) below, And one of the alternatives represents a relationship which is not represented by any of the figures given below. The relationship that complies this condition is your answer.**



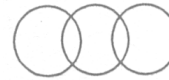
(A)



(B)



(C)



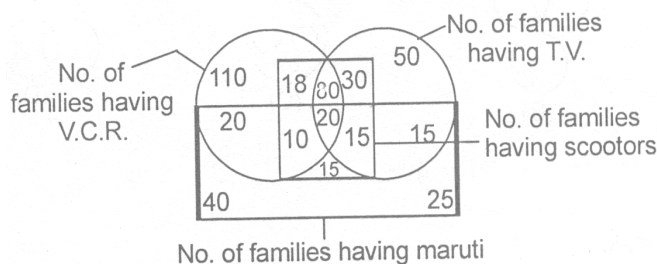
(D)



(E)

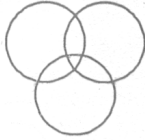
3. (A) Animal, Mammal, Cow (B) Colour, Cloth, Merchant  
 (C) Colour, Red, Blue (D) Male, Horse, Mare
4. (A) Periodicals, Weekly, Book (B) Mineral, Copper, Wood  
 (C) Doctors, Human beings, Married People (D) Army, Doctors, Engineers

**Directions : (5 to 9) Study the figure below and answer the following questions.**

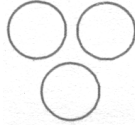


5. Find out the number of families which have all the four things mentioned in the diagram.  
 (A) 40 (B) 30 (C) 35 (D) 20
6. Find out the number of families which have scooters.  
 (A) 145 (B) 100 (C) 188 (D) 240
7. Find out the number of families which have V.C.R. and T.V. both  
 (A) 84 (B) 24 (C) 104 (D) 100
8. Find out the number of families which have only one thing, that is, either V.C.R. or T.C. or Scooter of Maruti.  
 (A) 160 (B) 184 (C) 225 (D) 254
9. Find out the number of families which have T.V. and scooter both but have neither V.C.R. nor Maruti.  
 (A) 15 (B) 30 (C) 4 (D) 50

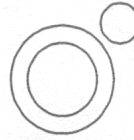
**Directions : (10 to 12)** Each question below contains three groups of things. You are to choose from the following five numbered diagrams, the diagram that depicts the correct relationship among the three groups of this in each question.



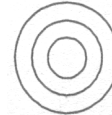
(A)



(B)



(C)



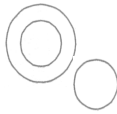
(D)

10. Vegetable, Apple, Spinach

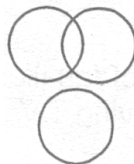
11. Clever, Punctual, Poor

12. Copper, Cobalt, Silver

**Directions : (13 to 15)** in each of the following questions, select the diagram out of the five that best represents the relationship among the items given in the questions.



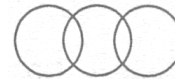
(A)



(B)



(C)



(D)

13. Doctor, Lawyer, Male

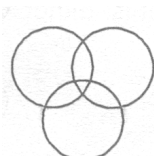
14. Man, Husband, Son

15. Female, medicine, Physician

**Direction : (16 to 20)** Out of the four alternatives in each of the following questions, three alternatives are such that the three words in each are related among themselves in one of the five ways represented by (A), (B), (C), (D) and (E) below, And one of the alternatives represents a relationship which is not represented by any of the figures given below. The relationship that complies this condition is your answer.



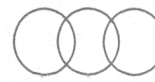
(A)



(B)



(C)



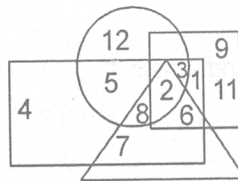
(D)



(E)

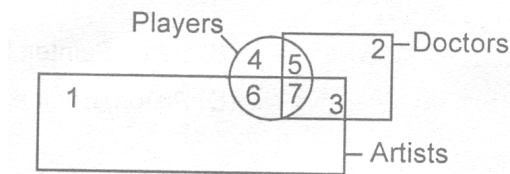
16. (A) Army, General, Colonel (B) Boy, Student, Player  
 (C) Painter, Scholar, Table (D) Man, Typist, Peon
17. (A) Hen, Dog, Cat (B) Body, Ear, Mouth  
 (C) Bed, Ward, Nurse (D) Tiger, Animal, Carnivorous
18. (A) Mineral, Iron, Copper (B) Dean, Painter, Singer  
 (C) Seed, Leaf, Root (D) Piston, Engine, Wheel
19. (A) Director, Engineer, Musician (B) Apple, Orange, Mango  
 (C) Fruit, Mango, Grass (D) Oxygen, Air, Water
20. (A) Atmosphere, Air, Oxygen (B) Boy, Girl, Student  
 (C) Man, Worker, Garden (D) Animal, Dog, Cat

**Directions : (21 to 24) Read the following information carefully and answer the questions based on them:**  
*The circle represents poor boys, the triangle represents the boys who are employed somewhere and the rectangle represents those help in the family business. Each section of the diagram is numbered.*



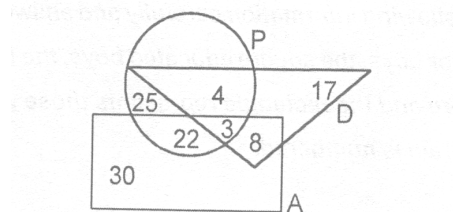
21. Which number represents those poor boys who help in family business but are not educated or employed elsewhere ?  
 (A) 2 (B) 3 (C) 4 (D) 5
22. Which number represents the group of educated poor boys who are employed somewhere but do not help in family business ?  
 (A) 3 (B) 11 (C) 2 (D) None of these
23. Which section does number 12 represent ?  
 (A) Uneducated poor boys who do not help in family business  
 (B) Educated poor boys employed in service  
 (C) Uneducated boys who help in family business  
 (D) Educated poor boys who help in family business.

24. Which number represents that section of poor boys who are neither educated nor are in any employment or have any family business ?  
 (A) 5 (B) 1 (C) 11 (D) 12
25. Which numbered space in the figure, represents doctors who are players as well as artists ?



- (A) 2 (B) 3 (C) 6 (D) 7

**Directions : (26 to 29) Study the following figure carefully and answer the questions :**  
**The triangle represents doctors. The circle represents players and the rectangle represents artists.**



26. How many doctors are both players and artists ?  
 (A) 6 (B) 8 (C) 4 (D) 3
27. How many artists are players ?  
 (A) 30 (B) 29 (C) 25 (D) 17
28. How many artists are neither players nor doctors ?  
 (A) 29 (B) 30 (C) 22 (D) 8
29. How many doctors are neither players nor artists ?  
 (A) 17 (B) 30 (C) 8 (D) 19

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	B	B	C	D	C	D	C	B	C	A	B	D	C	B
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Ans.	C	A	C	B	C	D	D	A	D	D	D	C	B	A	



# THE CALENDAR



## CONCEPT :

We are to find the day of the week on a mentioned date. Certain concepts are defined as under.

## ODD DAYS :

The no. of days exceeding the complete no. of weeks in a duration is the no. of odd days during that duration.

## ORDINARY YEAR :

An ordinary year has 365 days.

## LEAP YEAR :

A leap year has 366 days. Every year which is divisible by 4 is called a leap year. For example 1200, 1600, 1992, 2004, etc. are all leap years

## IMPORTANT REMARK :

The First year of every century year ending in 00's but not a multiple of 400 is not considered a leap year. For example 900, 1000, 1100, 1300, 1400, 1500, 1700, 1800, 1900, 2100 are not leap years.

## COUNTING OF ODD DAYS :

- (i) Every Ordinary year has 365 days = 52 weeks + 1 day  $\therefore$  (ordinary year has 1 odd day).
- (ii) Every leap year 366 days = 52 weeks + 2 days  $\therefore$  (leap year has 2 odd days).
- (iii) 100 years = 76 ordinary years + 24 leap years (The year 100 is not a leap year)  
= 76 odd days + 2  $\times$  24 odd days  $\Rightarrow$  124 odd days.

$$\frac{124}{7} = 5 \text{ (Remainder) } = 05 \text{ odd days}$$

Similarly, 200 years = 10 odd days = 03 odd days

$$300 \text{ years} = \frac{15}{7} = 01 \text{ odd day}$$

$$400 \text{ years} = \frac{20 + (1)}{7} = 0 \text{ odd day} \{1 \text{ is added as } 400 \text{ is a leap year}\}$$

Similarly, 800, 1200, 1600, 2000, 2400 years contain 0 odd days

**COUNTING OF DAYS :**

After counting the odd days, we find the days according to the no. of odd days → Sunday for 0 odd day, Monday for 01 odd day and so on.

**IMPORTANT NOTES :**

- (i) In an Ord. Year, First & last day of the year are the same.

**Ex.** If 1 Jan Friday then 31 Dec. will also have Friday.

(ii) For a leap year, if first day is Monday then last day will be Tuesday for the same year.

(iii) Calendar year 1 Jan to 31 Dec. Financial year 1 April to 31 March.

(iv) The day on which calendar started i.e., 1 Jan, 001 was Monday.

(v) In a Leap year, February is of 29 days. In an ordinary year, February has 28 days.

Ordinary Year – 365 days		Leap year – 366 days	
January	31	January	31
February	28	February	29
March	31	March	31
April	30	April	30
May	31	May	31
June	30	June	30
<b>Total</b>	<b>181 days</b>	<b>Total</b>	<b>182 days</b>
July	31	July	31
August	31	August	31
September	30	September	30
October	31	October	31
November	30	November	30
December	31	December	31
<b>Total</b>	<b>184 days</b>	<b>Total</b>	<b>184 days</b>

**ILLUSTRATIONS :**

**Ex 1.** Find the day of the week on 16 January, 1969.

**Sol.** 1600 years has '0' odd day.....(A).  
 300 years have '1' odd day .....(B).  
 68 years have 17 leap and 51 ordinary years.  
 Thus  $= (17 \times 2 + 51 \times 1) = 85$  odd days  
 $\equiv '01'$  odd day .....(C)  
 16 January has = '02' odd days...(D)  
 Adding (A) + (B) + (C) + (D),  
 We get,  $0 + 01 + 01 + 02 = 04$  odd days

**Ans.** Thursday

**Ex 2.** Find the day of the week on 18 July, 1776 (leap year)

**Sol.** Here 1600 years have '0' odd day.....(A)  
 100 years have '5' odd .....(B).  
 75 years =(18 leap years + 57 ordinary years)  
 $= (18 \times 2 + 57 \times 1)$   
 $= 93$  odd days  
 $= (7 \times 13 + 2) = '2'$  odd days .....(C)  
 Now, the no. of days from 1st January to 18 July, 1776  
 $= 182 + 18 = 200$  days  
 $= (28 \times 7 + 4)$  days = '4' odd days .....(D)  
 Adding (A) + (B) + (C) + (D),  
 We get,  $0 + 5 + 2 + 4 = 04$  odd day

**Ans.** Thursday

**Ex 3.** On what dates of October, 1975 did Tuesday fall ?

**Sol.** For determining the dates, we find the days on 1st Oct, 1975.  
 1600 years have '0' odd days .....(A).  
 300 years have '01' odd days .....(B).  
 74 years have (18 leap years + 56 ordinary years)  
 $2 \times 18 + 1 \times 56 = 92$  odd days  
 $= '01'$  odd days .....(C)  
 Days from 1st January to 1st Oct., 1975  
 1st Jan - 30 June + 1st July to 1st Oct.  
 $181 + 31 + 31 + 30 + 1 = 274$  days  
 $= '01'$  odd days (D)  $(274/7 = 01 \text{ days})$   
 Adding (A) + (B) + (C) + (D) =  $0 + 01 + 01 + 01 = '03'$  odd days

**Ans.** Wednesday (1st Oct), hence 7, 14, 21, 28 Oct. will Tuesday fall.

**Ex 4.** Calendar for 1995 will serve for 2006, prove ?

**Sol.** The Calendar for 1995 and 2006 will be the same, if day on 1st January of both the years is the same. This is possible only if the total odd days between 31st Dec. 1994 and 31st Dec. 2005 is 0. [one day before both the years as we want to know the days on 1st January of both the years i.e. same]  
 During this period, we have  
 3 leap years and 08 ordinary years  
 (1996, 2000, 2004) (1995, 1997, 1998, 1999, 2001, 2002, 2003, 2005)  
 Total odd days =  $(2 \times 3 + 1 \times 8) = 14 = 0$  odd days (**Thus Proved**)





## PRACTICE EXERCISE

1. Find the day of the week on 26 January, 195.  
(A) Tuesday (B) Friday (C) Wednesday (D) Thursday
2. Which two months in a year have the same calendar ?  
(A) June, October (B) April, November (C) April, July (D) October, December
3. Are the years 900 and 1000 leap years ?  
(A) Yes (B) No (C) Can't say (D) None of these
4. If it was Saturday on 17th November, 1962 what will be the day on 22nd November, 1964 ?  
(A) Monday (B) Tuesday (C) Wednesday (D) Sunday
5. Sangeeta remembers that her father's birthday was certainly after eight but before thirteenth of December. Her sister Natasha remembers that their father's birthday was definitely after ninth but before fourteenth of December. On which date of December was their father's birthday ?  
(A) 10th (B) 11<sup>th</sup> (C) 12<sup>th</sup> (D) Data inadequate
6. Find the day of the week on 15 August, 1947.  
(A) Tuesday (B) Friday (C) Wednesday (D) Thursday
7. Karan was born on Saturday 22nd March 1982. On what day of the week was he 14 years 7 months and 8 days of age ?  
(A) Sunday (B) Tuesday (C) Wednesday (D) Monday
8. If on 14th day after 5th March be Wednesday, what day of the week will fall on 10th Dec. of the same year ?  
(A) Friday (B) Wednesday (C) Thursday (D) Tuesday
9. If the day before yesterday was Saturday, what day will fall on the day after tomorrow ?  
(A) Friday (B) Thursday (C) Wednesday (D) Tuesday
10. If February 1, 1996 is Wednesday, what day is March 10, 1996 ?  
(A) Monday (B) Sunday (C) Saturday (D) Friday

11. If the seventh day of month is three days earlier than Friday, what day will it be on the nineteenth day of the month ?  
(A) Sunday (B) Monday (C) Wednesday (D) Friday
12. Mohini went to the movies nine days ago. She goes to the movies only on Thursday. What day of the week is today ?  
(A) Thursday (B) Saturday (C) Sunday (D) Tuesday

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	D	C	B	D	D	B	C	B	C	C	A	B



# ➤➤ CLOCK TEST ◀◀

## IMPORTANT NOTES :

- Minute hand and hour hand coincide once in every hour. They coincide 11 times in 12 hours & 22 times in 24 hours. They don't coincide between 12 & 1 O'clock.
- Minute hand & hour hand are opposite once in every hour. Then the two hands are opposite in direction, distance between them is of 30 minutes. They make an angle of  $180^\circ$  with each other. They do it 11 times in 12 hours & 22 times in 24 hours. It doesn't happen between 6 to 7 o'clock.
- Both hands (Minute & hour) are perpendicular twice in every hour. They make an angle of  $90^\circ$ . 22 times in 12 hours and 44 times in 24 hours.
- In one Minute, hour hand moves  $1/2^\circ$  & Minute hand moves  $6^\circ$ . In One hour, hour hand moves  $30^\circ$  & minute hand moves  $360^\circ$ .
- In an hour, minute hand moves 55 minutes ahead of hour hand.

## HANDS COINCIDE :

**Ex 1.** At what time between 3 & 4 will the two hands coincide ?

**Sol.** At 3 o'clock the distance between the two hands is 15 minutes. When they are at zero minutes distance, they coincide to each other. The time taken = 15 minutes.  
 $\therefore$  minute hand is 55 minutes ahead of hour hand in 60 minutes.

$$\begin{array}{rcl} \text{_____ 1 minute} & \text{_____} & \frac{60}{55} \\ \text{_____ 15 minutes} & \text{_____} & \frac{60 \times 15}{55} = 3 \text{ & } 16 \frac{4}{11} \text{ minutes} \end{array}$$

## HANDS ARE OPPOSITE :

**Ex 2.** At what time between 2 & 3 will the two hands are opposite ?

**Sol.** At 2 o'clock the distance between the two hands is 10 minutes. When they are at 30 minutes distance, they are opposite to each other. The time taken  $(30 + 10) = 40$  minutes.  
 $\therefore$  minute hand is 55 minutes ahead of hour hand in 60 minutes.

$$\begin{array}{rcl} \text{_____ 1 minute} & \text{_____} & \frac{60}{55} \\ \text{_____ 40 minutes} & \text{_____} & \frac{60 \times 40}{55} = 2 \text{ & } 43 \frac{7}{11} \text{ minute} \end{array}$$

**Table**  $\longrightarrow$  Hands are opposite

1 & 2	2 & 3	3 & 4	4 & 5	5 & 6	6 & 7	7 & 8	8 & 9	9 & 10	10 & 11	11 & 12	12 & 1
1 & $38 \frac{2}{11}$	2 & $43 \frac{7}{11}$	3 & $49 \frac{1}{11}$	4 & $54 \frac{6}{11}$	6	6	7 & $5 \frac{5}{11}$	8 & $10 \frac{10}{11}$	9 & $16 \frac{4}{11}$	10 & $21 \frac{9}{11}$	11 & $27 \frac{3}{11}$	12 & $32 \frac{8}{11}$

### HANDS ARE PERPENDICULAR :

**Ex 3.** At what time between 4 & 5 will the hands are perpendicular ?

**Sol.** At 4 o'clock the distance between the two hands is 20 minutes. When they are at 15 minutes distance, they are perpendicular to each other. The time taken 5 and  $(5 + 30) = 5$  and 35 minutes.  
 $\therefore$  minute hand in 55 minutes ahead of hour hand in 60 minutes.

$$\begin{array}{l} \text{_____ 1 minutes _____} \frac{60}{55} \\ \text{_____ 5 minutes _____} \frac{60 \times 5}{55} = 4 \text{ \& } 5 \frac{5}{11} \text{ min ute} \\ \text{and _____ 35 minutes _____} \frac{30 \times 35}{55} = 4 \text{ \& } 38 \frac{2}{11} \text{ min ute} \end{array}$$

### MIRROR IMAGE OF CLOCK :

1. If the time is between 1 to 11 o'clock, then to find the mirror image, time is subtracted by 11 : 60
2. If the time is between 11 to 1, then to find the mirror image, time is subtracted by 23 : 60

**Ex 4.** The time in the clock is 4 : 46, what is the mirror image ?

**Sol.**  $11 : 60 - 4 : 46 = 7 : 14$   
 or  
 $12 - 4 : 46 = 7 : 14$

**Ex 5.** The time in the clock is 12 : 35, then its mirror image will be -

**Sol.**  $23 : 60 - 12 : 35$   
 $= 11 : 25$

### TO FIND THE ANGLE BETWEEN TWO HANDS :

Minute hand moves  $30^\circ$  in 5 minutes &  $360^\circ$  in hour i.e., It moves  $6^\circ$  in One Minute  
 Hour Hand moves  $30^\circ$  in 60 minutes  
 In one minute, it moves  $0.5^\circ$

### ANGLE ARE OF TWO TYPES :

**Positive angle :** It is obtained by moving from Hour hand to minute Hand.

**Negative angle :** It is obtained by moving from minute hand to hour hand.

**Note :** Both types of angles are  $360^\circ$  in total. If one angle is known, other can be obtained by subtracting from  $360^\circ$ .

**Formula :** minutes of the given time are multiplied by  $5\frac{1}{2}$  .....a, Hour hand is multiplied by 30.....b, then a - b is the angle required.

**Ex 6.** At 4 : 30, what is the angle formed between hour hand & minute Hand ?

**Sol.**

4	30	= 165
↓	× 5 $\frac{1}{2}$	↔ 120
× 30	↔	45° (ans)

**Ex 7.** At 3 : 30, what is the angle formed between hour hand & minute hand ?

**Sol.**

3	15	
↓	× 5 $\frac{1}{2}$	= 82 $\frac{1}{2}$ 0
× 30		
90		
	(-) 90	
	-----	
	- 7 $\frac{1}{2}$ 0	
		$360 - 7\frac{1}{2} 0 = 352\frac{1}{2} 0$

## PRACTICE EXERCISE

1. At what time are the hands of a clock together between 5 and 6 ?  
 (A)  $33\frac{3}{11}$  min, past 5    (B)  $28\frac{3}{11}$  min. past 5    (C)  $27\frac{3}{11}$  min. past 5    (D)  $26\frac{3}{11}$  min. past 5
2. At what time between 9 and 10 will the hands of a clock be in the straight line, but not together ?  
 (A) 16 minutes past 9    (B)  $16\frac{4}{11}$  minutes past 9  
 (C)  $16\frac{6}{11}$  minutes past 9    (D)  $16\frac{9}{11}$  minutes past 9

3. At what time between 5 & 5 : 30 will the hands of a clock be at right angle ?
- (A)  $10\frac{10}{11}$  minutes past 5 (B)  $11\frac{5}{11}$  minutes past 5
- (C)  $9\frac{10}{11}$  minutes past 5 (D)  $10\frac{9}{11}$  minutes past 5
4. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop ?
- (A) 8.30 a.m. (B) 8.45 a.m. (C) 8.55 a.m. (D) Data inadequate
5. The priest told the devotee, "The temple bell is rung at regular intervals of 45 minutes. The last bell was rung five minutes ago. The next bell is due to be rung at 7.45 a.m. "At what time did the priest give this information to the devotee ?
- (A) 7.40 a.m. (B) 7.05 a.m. (C) 6.55 a.m. (D) None of these
6. There are twenty people working in an office. The first group of five works between 8.00 A.M. and 2.00 P.M. The second group of ten works between 10.00 A.M. and 4.00 P.M. And the third group of five works between 12 noon and 6.00 P.M. There are three computers in the office which all the employees frequently use. During which of the following hours the computers are likely to be used most ?
- (A) 10.00 A.M. - 12 noon (B) 12 noon - 2.00 P.M.
- (C) 1.00 P.M. - 3.00 P.M. (D) 2.00 P.M. - 4.00 P.M.
7. A tired worker slept at 7.45 p.m. If he rose at 12 noon, for how many hours did he sleep ?
- (A) 5 hours 15 min. (B) 16 hours 15 min. (C) 12 hours (D) 6 hours 45 min.
8. How many times are the hands of a clocks perpendicular in a day ?
- (A) 42 (B) 48 (C) 44 (D) 46
9. If a clock shows 04 : 28 then its mirror image will be ?
- (A) 07 : 42 (B) 07: 32 (C) 08: 32 (D) 08: 42
10. A watch, which gains uniformly, is 3 minutes slow at noon on Monday and is 3 minutes 48 seconds fast at 2 p.m. on the following Monday. What time it was correct ?
- (A) 2 p.m. On Tuesday (B) 2 p.m. On Wednesday
- (C) 3 p.m. On Thursday (D) 1 p.m. On Friday.
11. How many times are the hands of a clocks coincide in a day ?
- (A) 10 (B) 11 (C) 12 (D) 22
12. At what time between 2 and 3 O' clock the hands of clock will make an angle of  $160^\circ$  ?
- (A) 20 minutes past 2 (B) 30 minutes past 2 (C) 40 minutes past 2 (D) 50 minutes past 2

13. Ashish leaves his house at 20 minutes to seven in the morning, reaches Kunal's house in 25 minutes, they finish their breakfast in another 15 minutes and leave for their office which takes another 35 minutes. At what time do they leave Kunal's house to reach their office ?  
(A) 7.40 am (B) 7.20 am (C) 7.45 am (D) 8.15 am
14. The train for Lucknow leaves every two and a half hours from New Delhi Railway Station. An announcement was made at the station that the train for Lucknow had left 40 minutes ago and the next train will leave at 18.00 hrs. At what time was the announcement made ?  
(A) 15.30 hrs (B) 17.10 hrs (C) 16.00 hrs (D) None of these
15. A monkey climbs 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 a.m., at what time will he first touch a flag at 120 feet from the ground ?  
(A) 4 p.m. (B) 5 p.m. (C) 6 p.m. (D) None of these
16. If the two incorrect watches are set at 12 : 00 noon at correct time, when will both the watches show the correct time for the first time given that the first watch gains 1 min in 1 hour and second watch loses 4 min in 2 hours :  
(A) 6 pm, 25 days later (B) 12 : 00 noon, 30 days later  
(C) 12 noon, 15 days later (D) 6 am 5 days later
17. Rajeev and Sanjeev are too close friends Rajeev's watch gains 1 minute in an hour and Sanjeev's watch loses 2 minutes in an hour. Once they set both the watches at 12: 00 noon, with my correct watch. When will the two incorrect watches of Rajeev and Sanjeev show the time together ?  
(A) 8 days later (B) 10 days later (C) 6 days later (D) can't be determined
18. At a railway station a 24 hour watch loses 3 minutes in 4 hours. If it is set correctly on Sunday noon when will the watch show the correct time ?  
(A) 6 am after 40 days (B) 12 noon after 75 days  
(C) 12 pm after 100 days (D) 12 noon after 80 days
19. A swiss watch is being shown in a museum which has a very peculiar property. It gains as much in the day as it loses during night between 8 pm to 8 am. In a week many times will the clock show the correct time ?  
(A) 6 times (B) 14 times (C) 7 times (D) 8 times
20. A wrist watch which is running 12 minutes late on a Sunday noon is 16 minutes ahead of the correct time at 12 noon on the next Sunday. When is the clock 8 minutes ahead of time ?  
(A) Thursday 10 am (B) Friday noon (C) Friday 8 pm (D) Tuesday noon
21. A clock loses 2 minutes in a hour and another clock gains 2 minutes in every 2 hours. Both these clocks are set correctly at a certain time on Sunday and both the clock stop simultaneously on the next day with the time shown being 9 am and 10 : 06 AM. What is the correct time at which they stopped ?  
(A) 9 : 54 am (B) 9 : 44 pm (C) 9 : 46 am (D) 9 : 44 am
22. David sets his watch at 6 : 10 am on Sunday, which gains 12 minutes in a day. On Wednesday if this watch is showing 2 : 50 pm. What is the correct time ?  
(A) 1: 50 pm (B) 2 : 10 pm (C) 2 : 30 pm (D) 3 : 30 pm

23. Ramu purchased a second hand Swiss watch which is very costly. In this watch the minute-hand and hour hand coincide after every  $65\frac{3}{11}$  minutes. How much time does the watch lose or gain per day ?  
 (A) 4 min (B) 5 min (C) 4 min, 20 sec (D) none of these
24. My watch was 8 minutes behind at 8 pm on Sunday but within a week at 8 pm on Wednesday it was 7 minutes ahead of time. During this period at which time this watch has shown the correct time :  
 (A) Tuesday 10 : 24 am  
 (B) Wednesday 9 : 16 pm  
 (C) It cannot show the correct time during this period  
 (D) None of the above
25. Out of the following four choices which does not show the coinciding of the hour hand and minute-hand :  
 (A) 3 : 16 : 2 (B) 6 : 32 : 43 (C) 9 : 59 : 05 (D) 5 : 27 : 16
26. Kumbhakarna starts sleeping between 1 pm and 2 pm and he wakes up when his watch shows such a time that the two hands (i.e. hour-hand and minute-hand) interchange the respective places. He wakes up between 2 pm and 3 PM on the same night. How long does he sleep ?  
 (A)  $55\frac{5}{13}$  min (B)  $110\frac{10}{13}$  min (C)  $54\frac{6}{13}$  min (D) none of these
27. A clock loses 3% time during the first week and then gains 2% time during the next one week. If the clock was set right at 12 noon on a Sunday, what will be the time that the clock will show exactly 14 days from the time it was set right ?  
 (A) 1 : 36 : 48 (B) 1 : 40 : 48 (C) 1 : 41 : 24 (D) 10 : 19 : 12

**Direction (28 to 29) : A 12 dial clock has its minute hand defective. Whenever it touches dial 12, it immediately falls down to 6 instead of running smoothly (the hour hand remains unaffected during that fall). If was set right at 2 O' clock in the noon.**

28. What was the actual time when the minute hand of the clock touched dial 9 for the 5th time ?  
 (A) 2 : 15 (B) 3 : 00 (C) 5 : 15 (D) 6 : 45
29. If the actual time is 10 : 10, what is the position of the hour hand in the defective clock ?  
 (A) Between 2 and 3 (B) Between 4 and 5 (C) Between 10 and 11 (D) Between 3 and 4

## ANSWERS

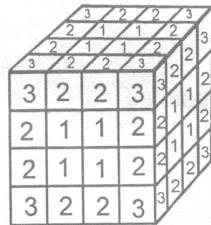
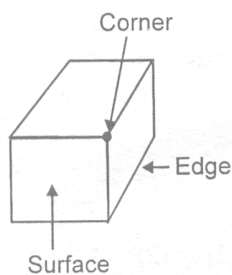
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	C	B	A	B	B	B	B	C	B	C	D	C	B	D	C
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Ans.	B	B	D	D	B	D	B	A	A	C	A	D	A	C	



# ➤➤➤ CUBES <<<

## **CUBES :**

A cube is three dimensional figure, having 8 corners, 6 surfaces and 12 edges. If a cube is painted on all of its surfaces with any colour and further divided into various smaller cubes, we get following results. Smaller cubes with three surfaces painted will be present on the corners of the big cube.



Smaller cubes with two surface painted will be present on the edges of the big cube. Smaller cubes with one surface painted will be present on the surfaces of the big cube. Smaller cubes with no surface painted will be present inside the big cube.

If a cube is painted on all of its surfaces with a colour and then divided into smaller cubes of equal size then after separation, number of smaller cubes so obtained will be calculated as under :

Number of smaller cubes with three surfaces painted = 8

Number of smaller cubes with two surface painted =  $(n - 2) \times 12$

Number of smaller cubes with one surfaces painted =  $(n - 2)^2 \times 6$

Number of smaller cubes with no surfaces painted =  $(n - 2)^3$

Where n =No of divisions on the surfaces of the bigger cube

$$= \frac{\text{lenth of edge of big cube}}{\text{lenght of edge of one smaller cube}}$$

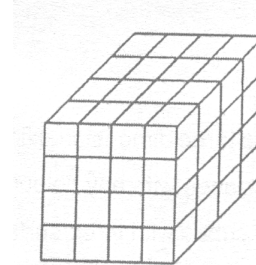
### TYPE I :

If a cube is painted on all of its surfaces with single colour and then divided into various smaller cubes of equal size.

**Directions :** A cube of side 4 cm. is painted black on all of its surfaces and then divided into various smaller cubes of side 1 cm each. The smaller cubes so obtained are separated.

$$\text{Total cubes of obtained} = \frac{4 \times 4 \times 4}{1 \times 1 \times 1} = 64$$

$$\text{Here } n = \frac{\text{side of big cube}}{\text{side of small cube}} = \frac{4}{1} = 4$$

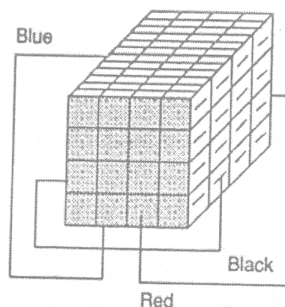


1. Number of smaller cubes with three surfaces painted = 8
2. Number of smaller cubes with two surfaces painted =  $(n - 2) \times 12$   
 $= (4 - 2) \times 12 = 24$
3. Number of smaller cubes with one surface painted =  $(n - 2)^2 \times 6$   
 $= (4 - 2)^2 \times 6 = 4 \times 6 = 24$
4. Number of smaller cubes with no surface painted =  $(n - 2)^3 = (4 - 2)^3 = (2)^3 = 8$

### TYPE II:

If a cube is painted on all of its surfaces with different colours and then divided into various smaller cubes of equal size.

**Directions :** A cube of side 4 cm is painted black on the pair of one opposite surfaces, blue, on the pair of another opposite surfaces and red on remaining pair of opposite surfaces. the cube is now divided into smaller cubes of equal of 1 cm each.



1. Number of smaller cubes with three surfaces painted = 8  
 (These smaller cubes will have all three surfaces painted with different colour blue, black and red.)

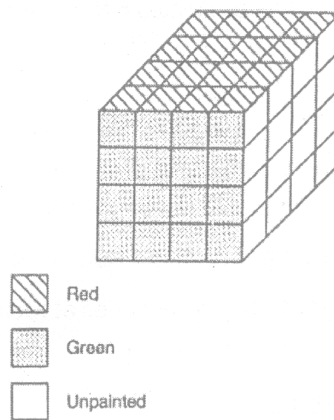
2. Number of smaller cubes with two surfaces painted = 24. And out of this -  
 (a) Number of cubes with two surfaces painted with black and blue colour = 8  
 (b) Number of cubes with two surfaces painted with blue and red colour = 8  
 (c) Number of cubes with two surfaces painted with black and red colour = 8.
3. Number of smaller cubes with one surface painted = 24. And out of this -  
 (a) Number of cubes with one surface painted with black colour = 8  
 (b) Number of cubes with one surface painted with blue colour = 8  
 (c) Number of cubes with one surface painted with red colour = 8

### TYPE III :

If a cube is painted on its surfaces in such a way that one pair of opposite surfaces is left unpainted.

**Directions :** A cube of side 4 cm is painted red on the pair of one opposite surfaces, green on the pair of another opposite surfaces and one pair of opposite surfaces is left unpainted. Now the cube is divided into 64 smaller cubes of side 1 cm each.

1. Number of smaller cubes with three surfaces painted = 0 (Because each smaller cube at the corner is attached to a surface which is unpainted.)
2. Number of smaller cubes with two surfaces painted = Number of cubes present at the corners + Numbers of cubes present at 4 edges  
 $= 8 (n - 2) \times 4$   
 $= 8 + 8 = 16$

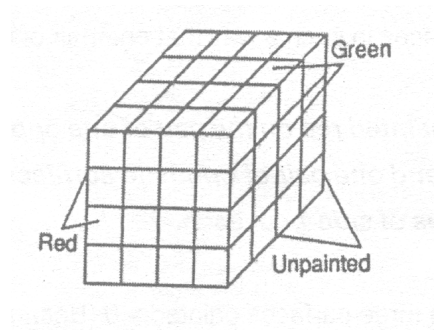


3. Number of smaller cubes with one surface painted.  
 $= \text{Number of cubes present at the 8 edges} + \text{number of cubes present at the four surfaces}$   
 $= (n - 2) \times 8 + (n + 2)^2 \times 4$   
 $= 2 \times 8 + 4 \times 4 = 16 + 16 = 32$
4. Number of smaller cubes with no side painted  
 $= \text{Number of cubes on the two unpainted surfaces} + \text{number of cubes present inside the cube.}$   
 $= (n - 2)^2 \times 2 + (n - 2)^3$   
 $= 4 \times 2 + (2)^3$   
 $= 8 + 8 = 16$

**TYPE IV :**

If a cube is painted on its surfaces in such a way that one pair of adjacent surfaces is left unpainted.

**Directions :** A cube of side 4 cm is painted red on the pair of one adjacent surfaces, green on the pair of other adjacent surfaces and two adjacent surfaces are left unpainted. Now the cube is divided into 64 smaller cubes of side 1 cm each.



1. Number of smaller cubes with three surface painted = Number of smaller cubes at two corners = 2
  
2. Number of smaller cubes with two surfaces painted = Number of smaller cubes at four corners + Number of smaller cubes at 5 edges.  

$$= 4 + (n - 2) \times 4 = 4 + 2 \times 5$$

$$= 4 + 10 = 14$$
  
3. Number of smaller cubes with one surface painted = Number of smaller cubes at four surfaces + Number of smaller cubes at 6 edges + Number of smaller cubes at two corners.  

$$= (n - 2)^2 \times 4 + (n - 2) \times 6 + 2$$

$$= 4 \times 4 + 2 \times 6 + 2 = 16 + 12 + 2 = 30$$
  
4. Number of smaller cubes with no surfaces painted = Number of smaller cubes from inside the big cube + Number of cubes at two surfaces + Number of cubes at one edge.  

$$= (n - 2)^3 + (n - 2)^2 \times 2 + (n - 2)$$

$$= (2)^3 + (2)^2 \times 2 + 2$$

$$= 8 + 8 + 2 = 18$$

## PRACTICE EXERCISE

**Direction : (1 to 5) A cube is coloured orange on one face, pink of the opposite face, brown on one face and silver on a face adjacent to the brown face. The other two faces are left uncoloured. it is then cut into 125 smaller cubes of equal size. Now answer the following questions based on the above statements.**

1. How many cubes have at least one face coloured pink ?  
(A) 1 (B) 9 (C) 16 (D) 25
2. How many cubes have all the faces uncoloured ?  
(A) 24 (B) 36 (C) 48 (D) 64
3. How many cubes have at least two faces coloured ?  
(A) 19 (B) 20 (C) 21 (D) 23
4. How many cubes are coloured orange on one face and have the remaining faces uncoloured ?  
(A) 8 (B) 12 (C) 14 (D) 16
5. How many cubes one coloured silver on one face, orange or pink on another face and have four uncoloured faces ?  
(A) 8 (B) 10 (C) 12 (D) 16

**Directions : (6 to 11) A cube is painted red on two adjacent surfaces and black on the surfaces opposite to red surfaces and green on the remaining faces. Now the cube is cut into sixty four smaller cubes of equal size.**

6. How many smaller cubes have only one surface painted ?  
(A) 8 (B) 16 (C) 24 (D) 32
7. How many smaller cubes will have no surface painted ?  
(A) 0 (B) 4 (C) 8 (D) 16
8. How many smaller cubes have less than three surfaces painted ?  
(A) 8 (B) 24 (C) 28 (D) 48
9. How many smaller cubes have three surfaces painted ?  
(A) 4 (B) 8 (C) 16 (D) 24

10. How many smaller cubes with two surfaces painted have one face green and one of the adjacent faces black or red ?  
(A) 8 (B) 16 (C) 24 (D) 28
11. How many smaller cubes have at least one surface painted with green colour ?  
(A) 8 (B) 24 (C) 32 (D) 56

**Directions : (12 to 16) A cube of 4 cm has been painted on its surfaces in such a way that two opposite surfaces have been painted blue and two adjacent surfaces have been painted red. Two remaining surfaces have been left unpainted. Now the cube is cut into smaller cubes of side 1 cm each.**

12. How many cubes will have no side painted ?  
(A) 18 (B) 16 (C) 22 (D) 8
13. How many cubes will have at least red colour on its surfaces ?  
(A) 20 (B) 22 (C) 28 (D) 32
14. How many cubes will have at least blue colour on its surfaces ?  
(A) 20 (B) 8 (C) 24 (D) 32
15. How many cubes will have only two surfaces painted with red and blue colour respectively ?  
(A) 8 (B) 12 (C) 24 (D) 30
16. How many cubes will have three surfaces coloured ?  
(A) 3 (B) 4 (C) 2 (D) 16

**Directions : (17 to 21) The outer border of width 1 cm of a cube with side 5 cm is painted yellow on each side and the remaining space enclosed by this 1 cm path is painted pink. this cube is now cut into 125 smaller cubes of each side 1 cm. The smaller cubes so obtained are now separated.**

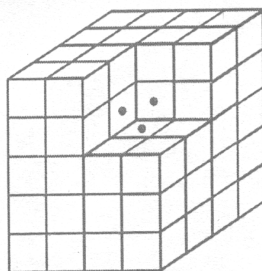
17. How many smaller cubes have all the surfaces uncoloured ?  
(A) 0 (B) 9 (C) 18 (D) 27
18. How many smaller cubes have three surfaces coloured ?  
(A) 2 (B) 4 (C) 8 (D) 10
19. How many cubes have at least two surfaces coloured yellow ?  
(A) 24 (B) 44 (C) 48 (D) 96

20. How many cubes have one face coloured pink and an adjacent face yellow ?  
 (A) 0 (B) 1 (C) 2 (D) 4
21. How many cubes have at least one face coloured ?  
 (A) 27 (B) 98 (C) 48 (D) 121

**Directions : (22 to 26) A cuboids of dimensions (6 cm × 4 cm × 1 cm) is painted black on both the surfaces of dimensions ( 4 cm × 1 cm), green on the surfaces of dimensions (6 cm × 4 cm). and red on the surfaces of dimensions (6 cm × 1 cm). Now the block is divided into various smaller cubes of side 1 cm. each. The smaller cubes so obtained are separated.**

22. How many cubes will have all three colours black, green and red each at least on one side ?  
 (A) 16 (B) 12 (C) 10 (D) 8
23. How many cubes will be formed ?  
 (A) 6 (B) 12 (C) 16 (D) 24
24. If cubes having only black as well as green colour are removed then how many cubes will be left ?  
 (A) 4 (B) 8 (C) 16 (D) 30
25. How many cubes will have 4 coloured sides and 2 sides without colour ?  
 (A) 8 (B) 4 (C) 16 (D) 10
26. How many cubes will have two sides with green colour and remaining sides without any colour ?  
 (A) 12 (B) 10 (C) 8 (D) 4

**Directions : (27 to 30) Some equal cubes are arranged in the form of a solid block as shown in the adjacent figure. All the visible surfaces of the block (except the bottom) are then painted.**



27. How many cubes do not have any of the faces painted ?  
 (A) 27 (B) 8 (C) 10 (D) 12

28. How many cubes have one face painted ?  
(A) 9 (B) 24 (C) 19 (D) 20
29. How many cubes have only two faces painted ?  
(A) 0 (B) 16 (C) 20 (D) 24
30. How many cubes have only three faces painted ?  
(A) 4 (B) 12 (C) 5 (D) 20

## ANSWERS

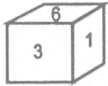
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	C	C	D	A	C	C	D	B	B	C	A	C	D	B
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	C	D	C	B	A	B	A	D	C	B	C	B	C	B	C



# »»» DICES «««

## CATEGORY : 1

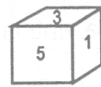
**Ex 1.** A dice has been thrown four times and produces following result.



(i)



(ii)



(iii)



(iv)

Which number will appear opposite to the number 3 ?

(A) 4

(B) 5

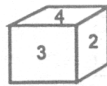
(C) 6

(D) 1

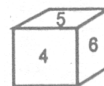
**Sol.** From the figures (i), (ii) and (iv) we find that numbers 6, 1, 5 and 2 appear on the adjacent surfaces to the number 3. Therefore, number 4 will be opposite to number 3. Hence option (a) is the answer.

## CATEGORY II :

**Ex 2.** The figures given below show the two different positions of a dice. Which number will appear opposite to number 2.



(i)



(ii)

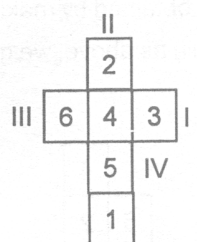
(A) 3

(B) 4

(C) 5

(D) 6

**Sol.** The above question, where only two positions of a dice are given, can easily be solved with the following method.



**Step I.**

The dice, when unfolded, will appear as shown is the figure given on the right side.

**Step II.**

Write the common number to both the dice in the middle block. Since common number is 4, hence number 4 will appear in the central block.

**Step III.**

Consider the figure (i) and write the first number in the anti-clockwise direction of number 4, (common number) in block I and second number in block II. Therefore, numbers 3 and 2 being the first and second number to 4 in anticlockwise directions respectively, will appear in block I & II respectively.

**Step Iv.**

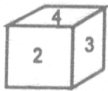
Consider figure (ii) and write first and second number in the anticlockwise direction to number 4, (common number) in block (III) & (IV). Hence numbers 6 and 5 will appear in the blocks III and IV respectively.

**Step V.**

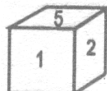
Write remaining number in the remaining block. Therefore, number 1 will come in the remaining block. Now, from the unfolded figures we find that number opposite to 6 is 3, number opposite to 2 is 5 and number opposite to 4 is 1. Therefore, option (c) is our answer.

**CATEGORY III :**

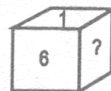
**Ex 3.** From the following figures of dice, find which number will come in place of ‘?’



(i)



(ii)



(iii)

(A) 4

(B) 5

(C) 2

(D) 3

**Sol.** If the above dice is unfolded, it will look like as the figure (1) given below.

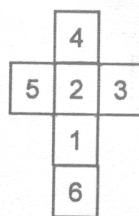


Figure (1)

Now the number in place of ‘?’ can be obtained by making a slight change in the figure as given here. Now comparing figure (2) with figure (iii) as above, we get that number in place of ? is 3.

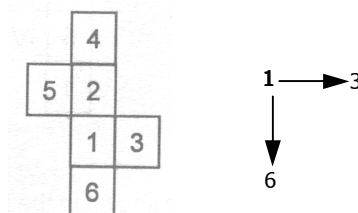
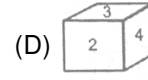
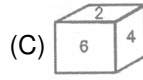
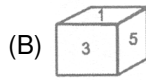
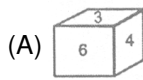


Figure (2)

#### CATEGORY IV :

**Ex 4.** Which of the following dices is identical to the unfolded figure as shown here ?



**Sol.** From the unfolded figure of dice, we find that number opposite to 2 is 4, for 5 it is 3 and for 1 it is 6. From this result we can definitely say that figure (B), (C) and (D) can not be the answer figure numbers lying on the opposite pair of surfaces are present on the adjacent surfaces. Hence fig. (A) is our answer.

### PARCITCE EXERCISE

1. Which alphabet is opposite D ?



(A) E

(B) C

(C) F

(D) A

2. What should be the number opposite 4 ?



(i)

(ii)

(iii)

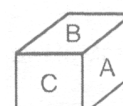
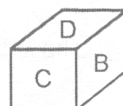
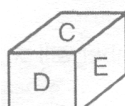
(A) 5

(B) 1

(C) 3

(D) 2

3.



(i)

(ii)

(iii)

(iv)

Which letter will be opposite to letter D ?

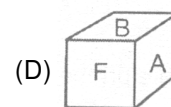
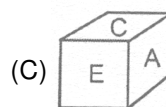
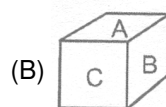
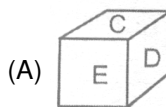
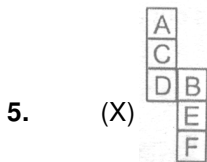
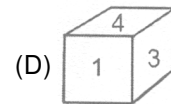
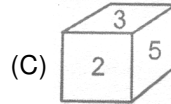
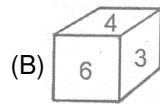
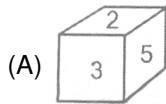
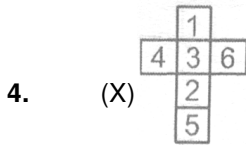
(A) A

(B) B

(C) E

(D) F

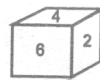
**Directions : (4 to 5)** The figure (X) given below is the unfolded position of a cubical dice. In each of the following questions this unfolded figure is followed by four different figures of dice. You have to select the figure which is identical to the figure (X).



**Directions : (6 to 8)** In each of the following questions, select the correct option for the questions asked.



(i)

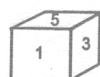


(ii)

6. Which number will come opposite to number 2 ?  
 (A) 5 (B) 1 (C) 6 (D) 3
7. Which number will come opposite to number 6 ?  
 (A) 1 (B) 5 (C) 4 (D) 3
8. Which number will come opposite to number 4 ?  
 (A) 3 (B) 5 (C) 1 (D) 2
9. On the basis of two figures of dice, you have to tell what number will be on the opposite face of number 5 ?



(i)



(ii)

- (A) 1 (B) 2 (C) 4 (D) 6

10. Which symbol will appear on the opposite surface to the symbol x ?



(i)



(ii)

11. (A) ÷ (B) = (C) Δ (D) O  
 Three positions of the same dice are given below. Observe the figures carefully and tell which number will come in place of '?'



(i)



(ii)



(iii)

12. (A) 1 (B) 6 (C) 3 (D) 5  
 On the basis of the following figures you have to tell which number will come in place of '?'



(i)



(ii)

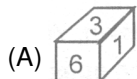
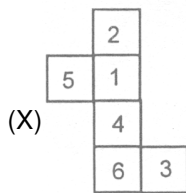


(iii)

- (A) 2 (B) 3 (C) 6 (D) 4

**Direction : (13 to 15) Choose from the alternatives, the boxes that will be formed when figure (X) is folded :**

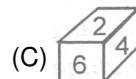
- 13.



(A)



(B)

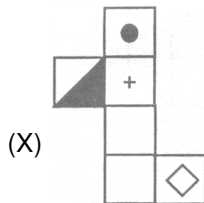


(C)



(D)

- 14.



(A)



(B)

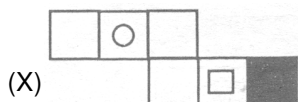


(C)



(D)

- 15.



(A)



(B)

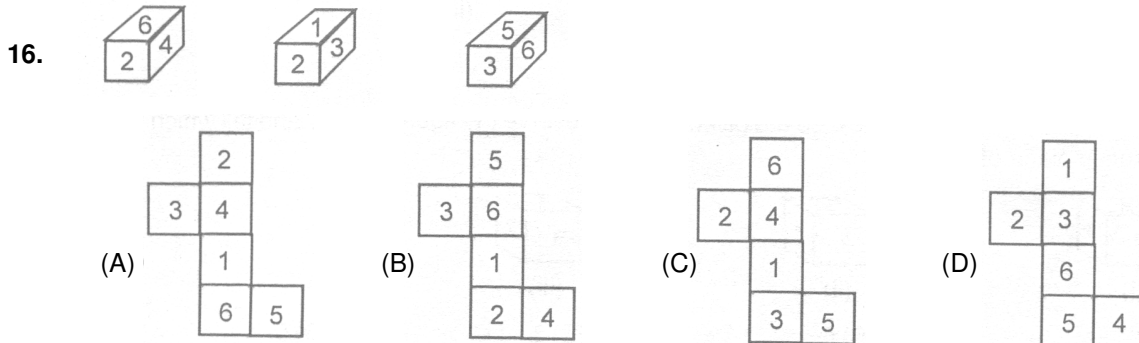


(C)



(D)

**Direction : (16)** The six faces of a cube have been marked with numbers 1, 2, 3, 4, 5 and 6 respectively. This cube is rolled down three times. The three positions are given. Choose the figure that will be formed when the cube is unfolded.



17. Which number is opposite 3 in a standard dice given below ?



- (A) 1 (B) 4 (C) 5 (D) Can't be determined

18. Which number is opposite 4 ?



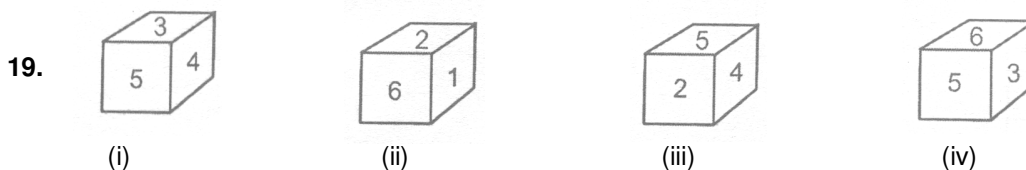
(i)



(ii)

- (A) 5 (B) 3 (C) 2 (D) 1

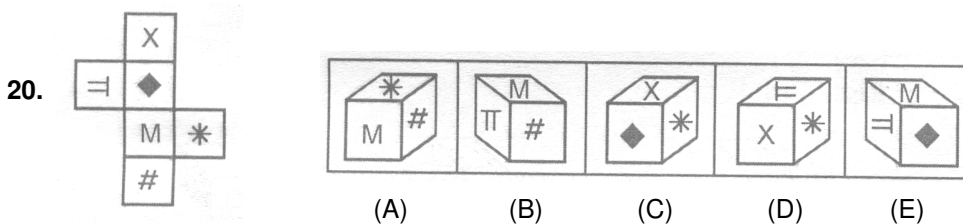
**Directions : (19)** In the following questions four positions of the same dice have been shown. You have to see these figures and select the number opposite to the number as asked in each question.



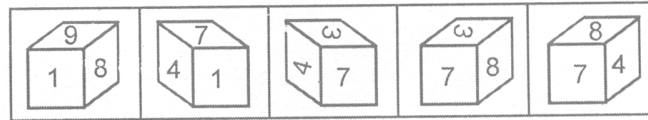
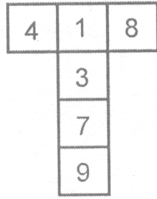
Which number is opposite to number 5 ?

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

**Directions : (20 to 24)** Choose the cube from the options that will unfold to give the figure on the left

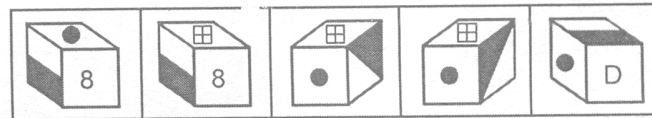
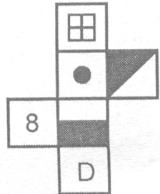


21.



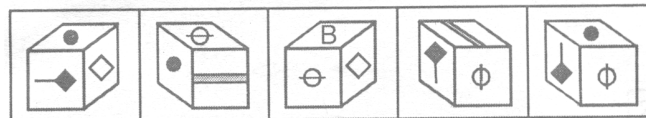
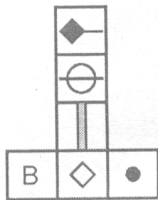
(A) (B) (C) (D) (E)

22.



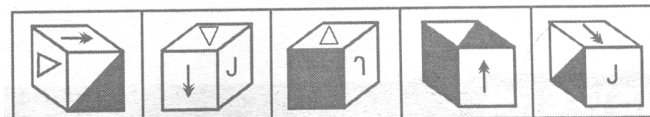
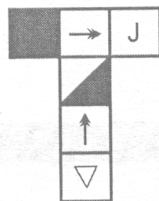
(A) (B) (C) (D) (E)

23.



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

24.



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

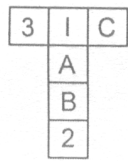
**Directions :** (25 to 28) In each of the following questions, a diagram has been given which can be folded into a cube. The entries given in the squares indicate the entries on the face of the cube. In each questions a number or a letter has been given. Of the four alternatives given below it, you have to find the one that would appear on the face opposite to it in the cube.

25. Which letter is opposite Q ?



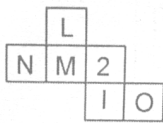
(A) L (B) M (C) N (D) P

26. Which number/letter is opposite 2 ?



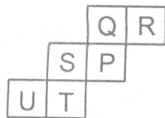
- (A) A (B) C (C) 1 (D) 3

27. Which number/letter is opposite O ?



- (A) L (B) M (C) N (D) 2

28. Which letter is opposite R ?



- (A) P (B) S (C) T (D) U

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Ans.	B	B	A	D	B	D	A	B	C	D	A	B	D	B
Que.	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Ans.	D	C	B	A	C	C	A	D	E	D	C	A	B	B





# FIGURE PARTITION

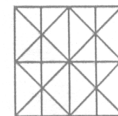


## FIGURE PARTITION :

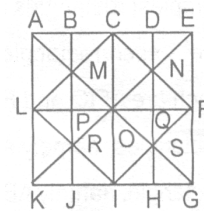
The chapter on Analytical Reasoning involves the problems relating to the counting of geometrical figures in a given complex figure. The systematic method for determining the number of any particular type of figure by the analysis of the complex figure would be clear from the examples that follow.

**Ex 1.** What is the number of straight lines in the following figure ?

- (A) 11
- (B) 14
- (C) 16
- (D) 17

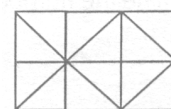


**Sol.** (B) The figure is labelled as shown.  
 Clearly, there are 3 horizontal lines namely AE, LF and KG.  
 There are 5 vertical lines : AK, BJ, CI, DH and EG.  
 There are 6 slanting lines : LC, KE, IF, LI, AG and CF.  
 Thus, there are  $3 + 5 + 6 = 14$  straight lines in the figure.

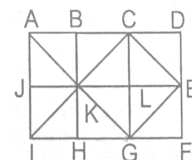


**Ex 2.** How many squares does the figure have ?

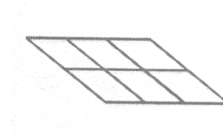
- (A) 6
- (B) 7
- (C) 9
- (D) 10



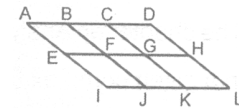
**Sol.** The figure may be labelled as shown :  
 The squares composed to two components each, are ABKJ, BCLK, CDEL, LEFG, KLGH, and JKHI. Thus, there are 6 such squares. Only one square, KCEG is composed of four components. Two squares namely, ACGI and BDFH are composed of eight components each. Thus, there are 2 such squares.  
 $\therefore$  There are  $6 + 1 + 2 = 9$  squares in the given figure.



- Ex 3.** How many parallelograms are there in the figure below ?  
 (A) 14 (B) 15  
 (C) 16 (D) 18

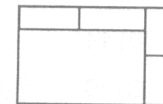


**Sol.** We can label the figure as shown.  
 The simplest parallelograms are ABFE, BCGF, CDHG, EFJI, FGKJ and GHKL. These are 6 in number. The parallelograms composed of two components each, are ACEG, BDHF, EGK, FHLJ, ABJI and CDLK. Thus, there are 7 such parallelograms. The parallelograms composed of four components each, are ACKI and BDLJ. i.e. 2 in number. There is only one parallelogram composed of six components, namely, ADLI. Thus, there are  $6 + 7 + 2 + 1 = 16$  parallelogram in the figure. Hence,

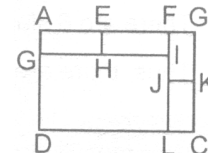


- Ex 4.** What is the number of rectangles in the following figure ?

- (A) 6  
 (B) 7  
 (C) 8  
 (D) 9



**Sol.** The figure is labelled as shown :  
 Simplest rectangles are AEHG, EFHJ, FBKJ, JKCL and GILD. i.e. there are 5 such rectangles. The rectangles composed of two components each are AFHG and FBCL. Thus, there are 2 such rectangles. Only one rectangles, namely AFLD is composed of 3 components and only one rectangle, namely ABCD is composed of 5 components. Thus, there are  $5 + 2 + 1 + 1 = 9$  rectangles in the figure.



- Ex 5.** Determine the number of pentagons in the following figure :

- (A) 5  
 (B) 6  
 (C) 8  
 (D) 10



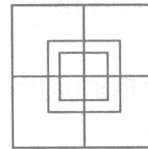
**Sol.** The figure may be labelled as follows :  
 In this case, six pentagons have been formed by the combination of three triangles and two rhombuses - ADFHJ, CFHJL, EHJLB, GJLBD, ILBDF and KBDFH. Four other pentagons are formed by the combination of three triangles and one rhombus - LCFHM, LBEHM, BKFHM and BLIFM. Thus, there are 10 pentagons in the figure.



## PRACTICE EXERCISE

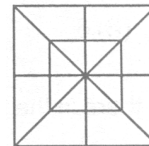
1. How many squares are there in the following figure ?

(A) 13  
(B) 14  
(C) 16  
(D) 15



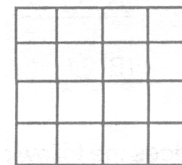
2. Count the number of triangles and squares in the following figure ?

(A) 28 triangles, 10 squares  
(B) 28 triangles, 8 squares  
(C) 32 triangles, 10 squares  
(D) 32 triangles, 8 squares.



3. Count the number of squares in the following figure ?

(A) 16  
(B) 17  
(C) 30  
(D) 55



4. Count the number of straight lines and triangles in the following figure ?

(A) 10 straight lines and 34 triangles  
(B) 9 straight lines and 34 triangles  
(C) 9 straight lines and 36 triangles  
(D) 10 straight lines and 36 triangles

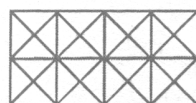


5. How many triangles and squares are there in the following figure ?



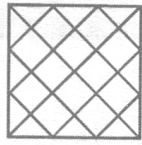
(A) 28 triangles, 5 squares  
(B) 24 triangles, 4 squares  
(C) 28 triangles, 4 squares  
(D) 24 triangles, 5 squares

6. Count the number of squares in the following figure :



(A) 15                      (B) 21                      (C) 24                      (D) 26

7. How many squares does the following figure have ?



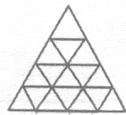
- (A) 17 (B) 18 (C) 13 (D) 16

8. How many triangles are there in the figure below ?



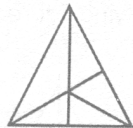
- (A) 5 (B) 6 (C) 8 (D) 10

9. How many triangles are there in the following figure ?



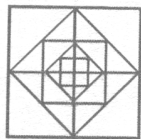
- (A) 19 (B) 21 (C) 27 (D) 48

10. How many triangles does the following figure contain ?



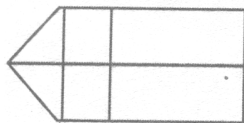
- (A) 11 (B) 10 (C) 6 (D) 12

11. How many squares does the figure have ?



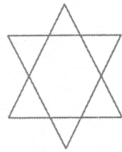
- (A) 17 (B) 12 (C) 13 (D) 15

12. How many rectangles are there in the given figure ?



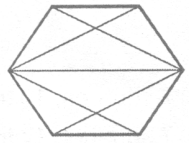
- (A) 6 (B) 7 (C) 8 (D) 9

13. How many triangles are there in the following figure ?



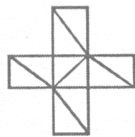
- (A) 6 (B) 7 (C) 8 (D) 9

14. Find the no. of pentagons :



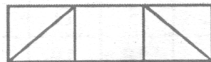
- (A) 2 (B) 3 (C) 4 (D) 6

15. How many triangles are there in the following figure ?



- (A) 11 (B) 14 (C) 16 (D) 7

16. How many quadrilateral there in the following figure ?



- (A) 11 (B) 8 (C) 2 (D) 4

17. How many triangles are thee in the following figure :



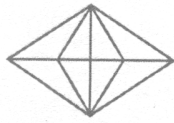
- (A) 18 (B) 16 (C) 22 (D) 26

18. Count the number of triangles in the figure given below :



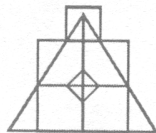
- (A) 15 (B) 19 (C) 22 (D) 24

19. How many triangles are there in the figure ?



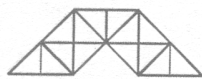
- (A) 10 (B) 14 (C) 22 (D) 20

20. How many squares are there in the following figure ?



- (A) 7 squares, 18 triangles (B) 7 squares, 19 triangles  
 (C) 8 squares, 17 triangles (D) 7 squares, 17 triangles

21. How many triangles are there in the following figure ?



- (A) 25 (B) 20 (C) 31 (D) 29

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11
Ans.	D	C	C	C	A	C	B	D	C	D	A
Que.	12	13	14	15	16	17	18	19	20	21	
Ans.	D	C	D	B	A	B	D	D	A	D	

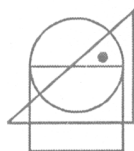


# >>> DOT SITUATION <<<

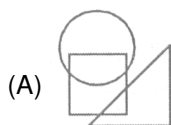
The problems on dot situation involve the search of similar conditions in the alternative figures as indicated in the problem figure. The problem figure contains dots placed in the spaces enclosed between the combinations of square, triangle, rectangle and circle. Selecting on the these dots we observe the region in which this dot is enclosed i.e. to which of four figures (circle, square, rectangle and triangle) is this region common. Then we look for such a region in the four alternatives. Once we have found it. we repeat the procedure for other dots, if any. The alternative figure which contains all such regions is the answer.

**Directions :** In each of the following questions, there is a diagram marked (X), with one or more dots placed in it. The diagram is followed by four other figures, marked (A), (B), (C) and (D) only one of which is such as to make possible the placement of the alternative in each case.

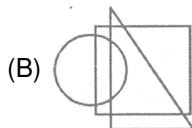
Ex 1.



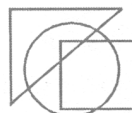
(X)



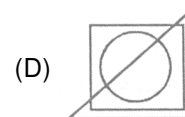
(A)



(B)



(C)

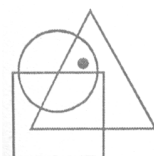


(D)

Sol.

(C) In figure (X), the dot lies in the region common to the circle and the triangle only. Such a region is present in figure (C) only.

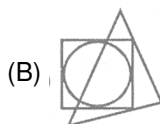
Ex 2.



(X)



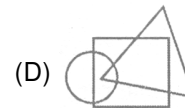
(A)



(B)



(C)

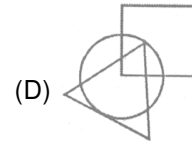
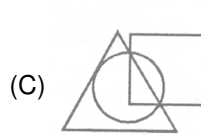
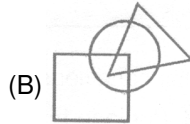
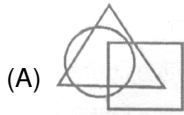
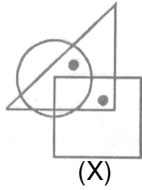


(D)

Sol.

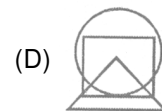
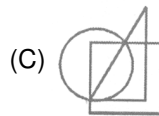
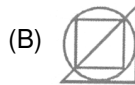
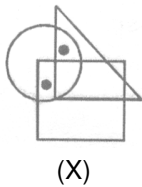
(C) In figure (X), the dot lies in the region common to the circle and the triangle only. Such a region is present in figure (C) only.

Ex 3.



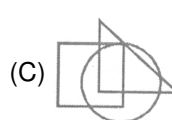
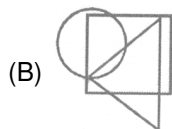
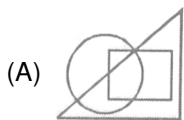
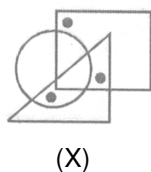
**Sol.** In figure (X), one of the dots is placed in the region common to the circle and the triangle and the other dot is placed in the region common to the triangle and the square. From amongst the figures (A), (B), (C) and (D), only figure (A) has both the regions, one common to circle and triangle and the other common to triangle and square. Hence, figure (A) is the answer.

Ex 4.



**Sol.** (B) In figure (X), one of the dot lies in the region common to the circle and the triangle only and the other dot lies in the region common to the circle and the square only. In figures (A), (C) and (D) the region common to the circle and the triangle lies within the square. Only figure (B) contains a region common to the circle and the triangle only and also a region common to the circle and the square.

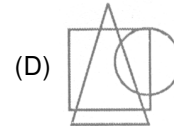
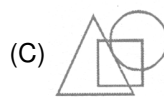
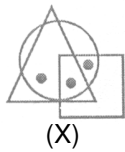
Ex 5.



**Sol.** (C) Figure (X), contains one dot in the square only, another dot in the region common to the square and the triangle only and the third dot in the region common to the circle and the triangle. Figure (A) does contain a region which lies in the square alone. Figures (B) and (D) do not contain any region common to the circle and the triangle. Only figure (C) contains all the three types of regions.



Ex 6.



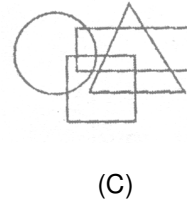
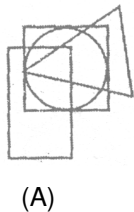
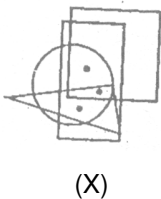
Sol.

(B) Figure (X) contains one dot in the region common to the circle and the triangle, another dot in the region common to all the three figures and the third dot in the region common to the square and the circle only. In figures (A) and (D), the region common to the circle and the triangle lies within the square. In figure (C), there is no region common to the circle and the triangle. Only figure (B) contains all the three types of regions.

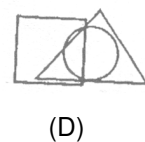
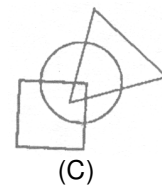
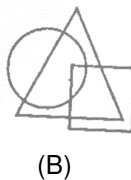
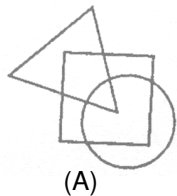
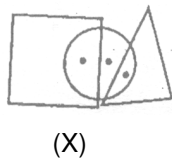
## PRACTICE EXERCISE

**Directions : (1 to 5)** In the following question a dot is placed in the figure marked as (X), this figure is followed by four alternatives marked as (A), (B), (C) and (D). One out of these options contains the common region to circle, square, triangle and rectangle similar to that of marked by dot in figure (X). Select that option.

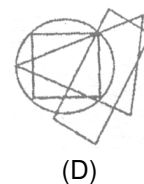
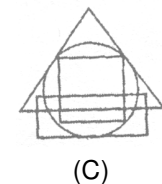
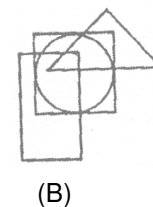
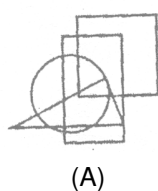
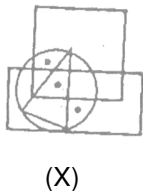
1.



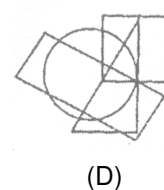
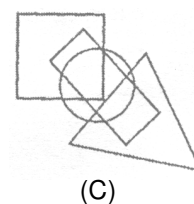
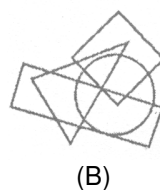
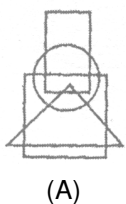
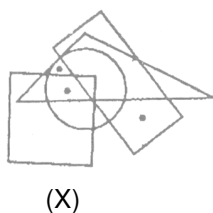
2.



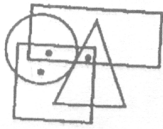
3.



4.



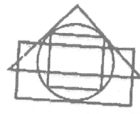
5.



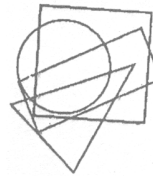
(X)



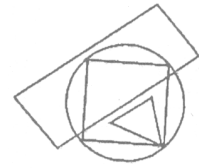
(A)



(B)

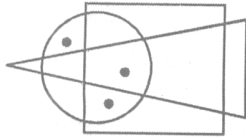


(C)

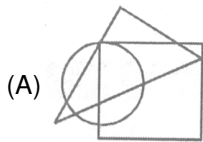


(D)

6.



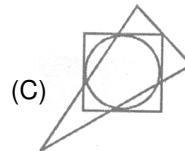
(X)



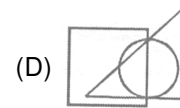
(A)



(B)

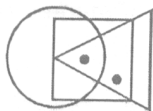


(C)

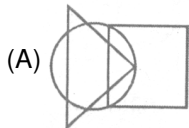


(D)

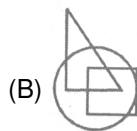
7.



(X)



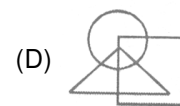
(A)



(B)

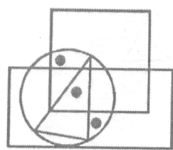


(C)

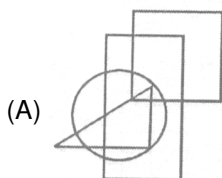


(D)

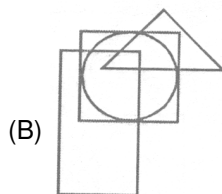
8.



(X)



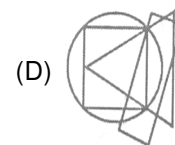
(A)



(B)

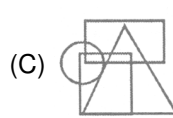
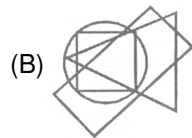
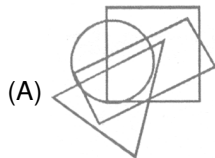
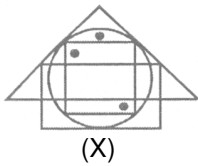


(C)

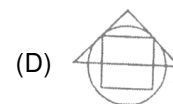
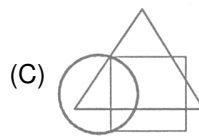
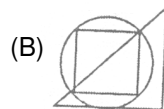
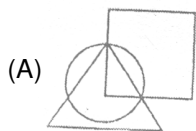
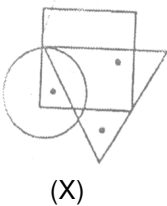


(D)

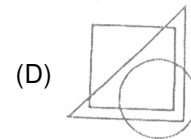
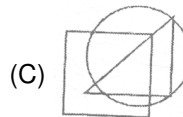
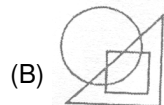
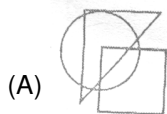
9.



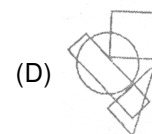
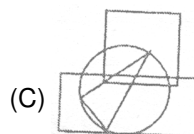
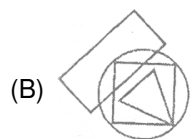
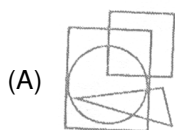
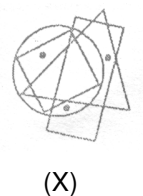
10.



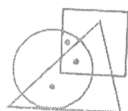
11.



12.

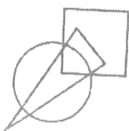


13.



(X)

(A)



(B)



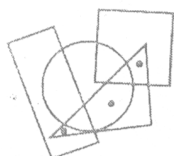
(C)



(D)

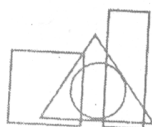


14.

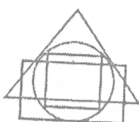


(X)

(A)



(B)



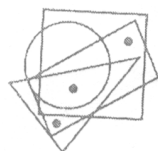
(C)



(D)

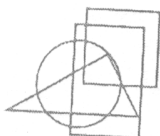


15.

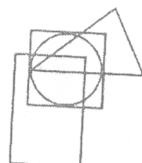


(X)

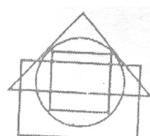
(A)



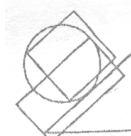
(B)



(C)



(D)



## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	C	D	B	C	A	D	D	B	C
Que.	11	12	13	14	15					
Ans.	A	D	D	A	A					

# MIRROR IMAGES



AND



# WATER IMAGES



## MIRROR IMAGES :

Here questions are based on criteria that few figures are given and you have to find out of which one is exact image of the given figure by the mirror placed aside. This image formation is based on the principle of 'LATERAL INVERSION' which implies that size of the image is equal to the size of the object but both sides are changes. The left portion of the object is seen on through portion and right portion of the object is seen on the left portion. For example mirror image of ABC = \$\$

**NOTE :** There are '11' letter in English Alphabet which have identical mirror images as  
A, H, I, O, T, U, V, W, X, Y

### I. Mirror Images of capital letters.

A	A
B	Ɓ
C	Ɔ
D	ɹ
E	Ǝ
F	ɟ
G	Ɔ
H	H
I	I
J	ɹ
K	Ɔ
L	J
M	M

N	И
O	O
P	q
Q	Q
R	Я
S	Ɔ
T	T
U	U
V	V
W	W
X	X
Y	Y
Z	Ɔ

### Mirror Images of small letters.

a	ɹ
b	d
c	ɔ
d	b
e	Ǝ
f	ɟ
g	Ɔ
h	ɹ
i	i
j	ɹ
k	Ɔ
l	l
m	m

n	n
o	o
p	q
q	p
r	ɹ
s	Ɔ
t	ɹ
u	u
v	v
w	w
x	x
y	Ǝ
z	Ɔ

### II. Mirror Images of Numbers

0	0
1	1
2	2
3	3
4	4
5	5

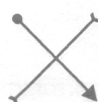
6	9
7	7
8	8
9	6
10	01

Reflection of an object into the mirror is called mirror-image. It is obtained by inverting an object laterally i.e. towards the sides. Example of lateral inversions of few figures and words are given below :

### Objects having Different Mirror Images :

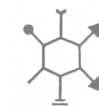
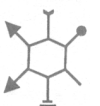
#### OBJECTS

#### MIRROR IMAGES



#### OBJECTS

#### MIRROR IMAGES



### Mirror images of certain words and numbers

#### Word

#### Mirror Images

#### Numbers

#### Mirror Images

PREDICTION

NOITCIREP

32596

83259

HOSPITAL

LATHSPOH

8932

2389

DARPA

APRAD

868

868

STRIGENT

TNGIRTS

768

867

OPULENT

TNEULO

10190

01019

SARCASM

MSACRAS

5693

3965

LIBERAL

LAREBL

8964

4698

OFFENCE

ECNEFFO

7362

2367

ADVANCE

ECNAD

5893

3895

IMAGES

SEGA

7839

9387

### WATER IMAGE :

**Water-image :** The reflection of an object as seen in water is called its water image. It is the inverted image obtained by turning the object upside down.

#### Water-Images of capital letters

Letters	A B C D E F G H I J K L M
Water-Image	V B C D E F G H I J K L M
Letters	N O P Q R S T U V W X Y Z
Water-Image	N O P Q R S T U V W X Y Z

#### Water-Images of small letters

Letters	a b c d e f g h i j k l m
Water-Image	a b c d e f g h i j k l m
Letters	n o p q r s t u v w x y z
Water-Image	n o p q r s t u v w x y z

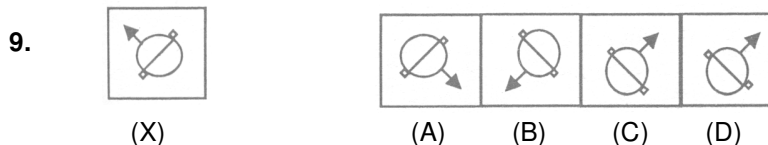
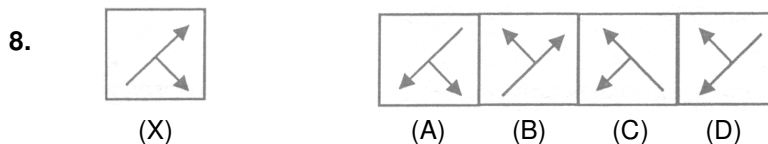
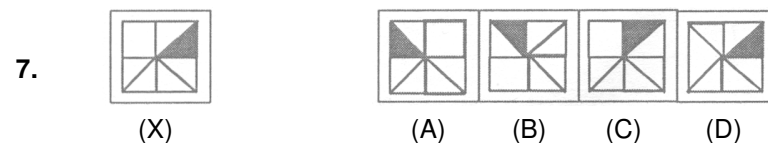
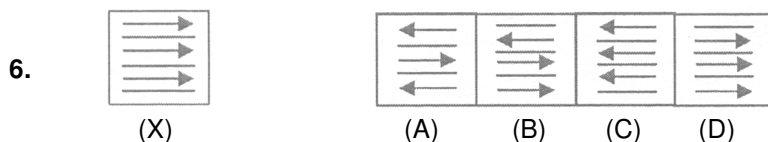
## Water-Images of numbers

Numbers	0	1	2	3	4	5	6	7	8	9
Water-Image	0	↓	5	3	4	2	9	↓	8	9

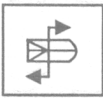
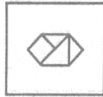
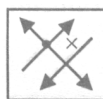
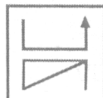


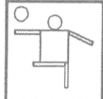
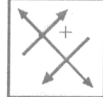
## PRACTICE EXERCISE

**Directions :** (1 to 17) In each for the following questions, choose the correct mirror image from alternatives A, B, C, and D of the Word/figure(X).

- VINAYAKA  
(A) INVAYAKA (B) AKAYANIV (C) AKAYANIV (D) AKAYANIV
- VERBAL  
(A) LABREV (B) LRVEBA (C) REVBAL (D) JABREV
- CONSOLIDATE  
(A) ETADILOSNO (B) ETADILOSNO (C) TAECONSOLID (D) OCONSOLIDATE
- JUDGEMENT  
(A) TNEMEGDUJ (B) TJUDGEMEN (C) TJUDGEMEN (D) DJUGEMNET
- TARAIN1014A  
(A) (B) A4101NIARAT (C) A410ARTAIN1 (D) A410ARTAIN1





10.   
 (X) (A) (B) (C) (D)
11.   
 (X) (A) (B) (C) (D)
12.   
 (X) (A) (B) (C) (D)
13.   
 (X) (A) (B) (C) (D)
14.   
 (X) (A) (B) (C) (D)
15.   
 (X) (A) (B) (C) (D)
16.   
 (X) (A) (B) (C) (D)
17.   
 (X) (A) (B) (C) (D)

**Directions : (18 to 33) In each for the following questions, choose the correct water-image from alternatives A, B, C and D of the Word/figure (X).**

18. 96FSH52  
 (A) 25H2E96 (B) 25H2E96 (C) 25H2E96 (D) 25H2E96
19. 50JA32DE06  
 (A) 90E23A05 (B) 90E23A05 (C) 90E23A05 (D) 90E23A05



20. RAJ589D8

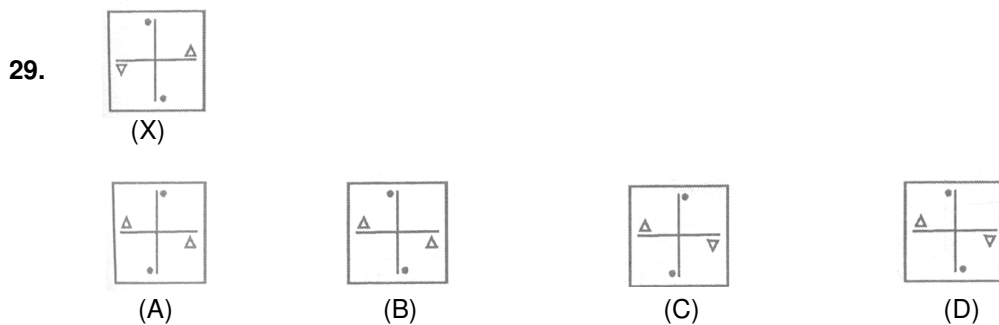
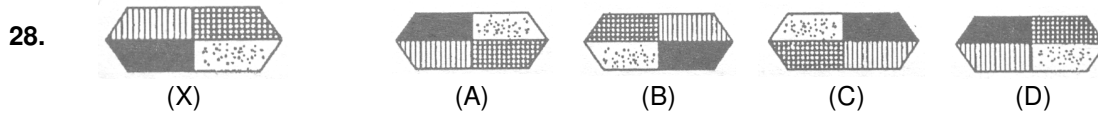
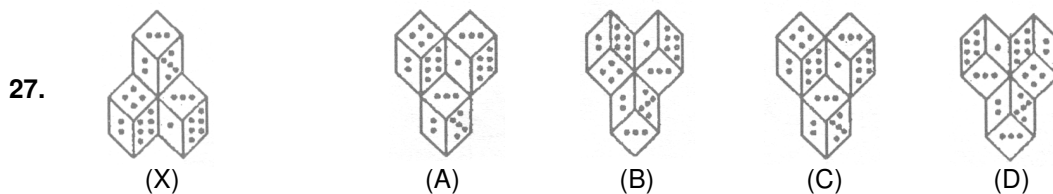
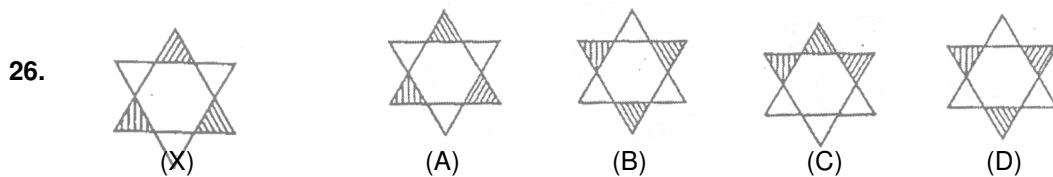
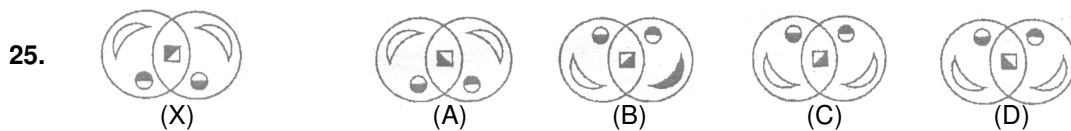
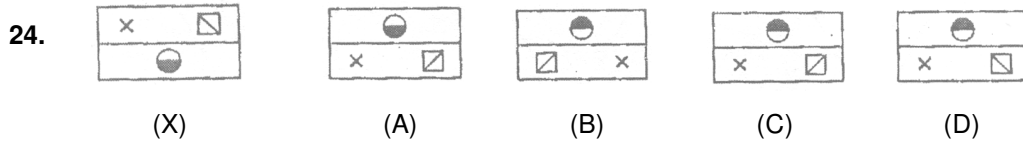
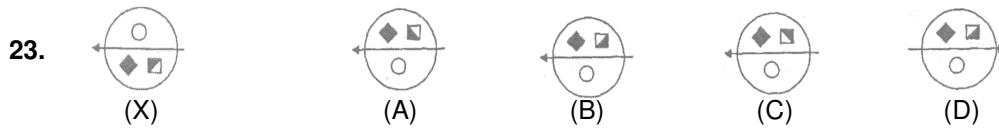
- (A) 8D958AJR (B) 8D958AJR (C) 8D958AJR (D) 8D958AJR

21. Monday

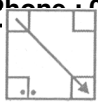
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22. wrote

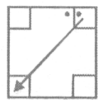
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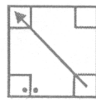
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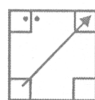
(X)



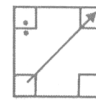
(A)



(B)



(C)

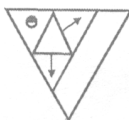


(D)

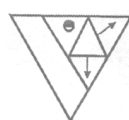
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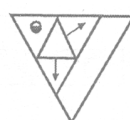
(X)



(A)



(B)

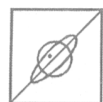


(C)



(D)

32.



(X)



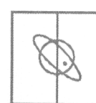
(A)



(B)



(C)



(D)

33.



(X)



(A)



(B)



(C)



(D)

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11
Ans.	C	D	B	C	A	C	A	C	C	D	D
Que.	12	13	14	15	16	17	18	19	20	21	22
Ans.	B	A	B	B	D	B	C	B	A	D	C
Que.	23	24	25	26	27	28	29	30	31	32	33
Ans.	A	C	D	D	B	A	C	C	B	B	D



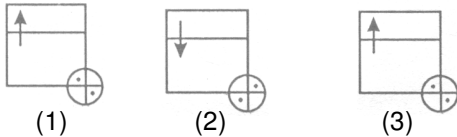
## NON - VERBAL SERIES



### TYPE I :

In this type of nonverbal test, two sets of figures pose the problem. The sets are called problem Figures and Answer Figures. Each problem figure changes in design from the preceding one. The answer figure set contains 4 figures marked A, B, C, D. You are required to choose the correct answer figure, which would best continue the series.

- Ex 1.** Study the problem figures marked 1, 2 and 3 carefully and to establish the relationship between them. From the answer figures marked A, B, C and D, pick out the figure which most appropriately completes the series.  
**Problem Figures**

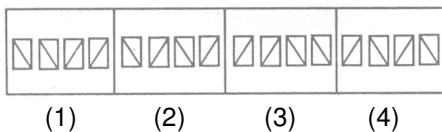


### Answer Figures

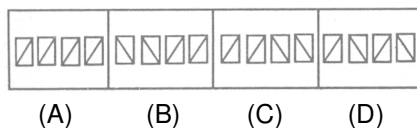


- Sol.** (D) Note the direction of arrow which changes alternately. The dots are also changing alternately. Hence, we are looking for a figure in which the arrow points down and the dots are positioned as in figure (2)/

### Ex 2. Problem Figures

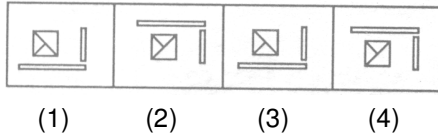


### Answer Figures

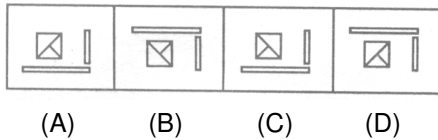


- Sol.** (B) The four boxes are changing position in the following way : At first, middle boxes change position (diagonally) and extreme boxes remain stationary, then extreme boxes change position and middle boxes remain stationary and so on.

**Ex 3. Problem Figures**

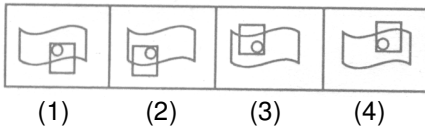


**Answer Figures**

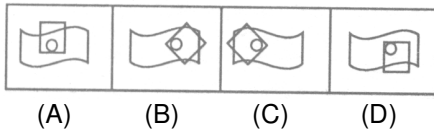


**Sol.** (C) The same figures rotates up-side -down in alternative figures.

**Ex 4. Problem Figures**

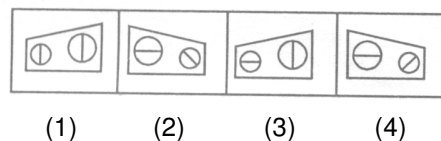


**Answer Figures**

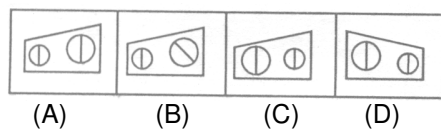


**Sol.** (D) The figures is rotated at  $90^\circ$  (in four directions) and the fifth figure in the series shall be same as the first figure.

**Ex 5. Problem Figures**



**Answer Figures**

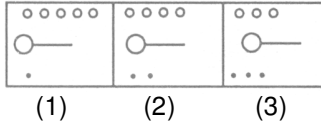


**Sol.** (A) The bigger balls diameter is moving at  $90^\circ$  and smaller balls diameter is moving at  $45^\circ$ , simultaneously the face of the bigger figure is changing position.

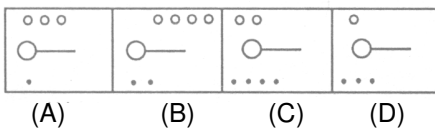
**TYPE II :**

In these questions the item in the diagrams either increase or decrease in number.

**Ex 6. Problem Figures**

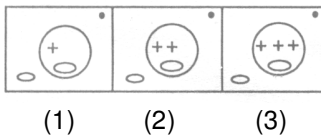


**Answer Figures**

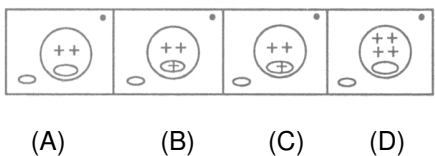


**Sol.** (C) The small circles are decreasing consecutively and the black dots are increasing.

**Ex 7. Problem Figures**

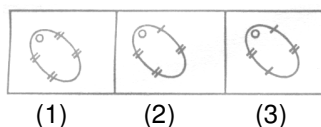


**Answer Figures**

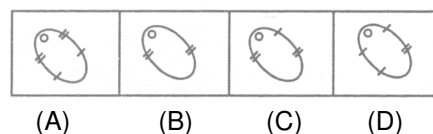


**Sol.** (D) Signs of Plus are adding up one by one. Figure (1) has one plus sign, Figure (2) has two signs, figures (3) has three signs, the next figure should have 4 signs to keep the same pattern.

**Ex 8. Problem Figures**



**Answer Figures**



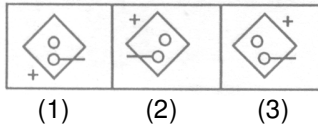
**Sol.** (D) Here a decreasing trend is followed. In the first figure there are 8 lines cutting through the sides of the sphere. Second figure has 7 lines. The third figure has 6 lines. To continue the series, fourth figure should have 5 lines.

### TYPE III :

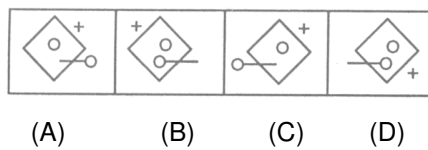
The qualitative characteristics of various elements in the diagrams change to complete the series.

**Relation Type :** The various elements in the diagrams move in a specific manner. They may rotate in clockwise or anti-clockwise direction.

#### Ex 9. Problem Figures

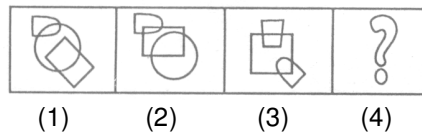


#### Answer Figures

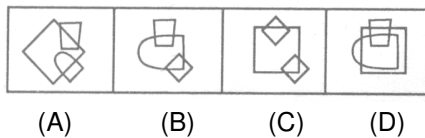


**Sol.** (D) The sign of plus is rotating clock wise. The pin changes direction alternately.

#### Ex 10. Problem Figures

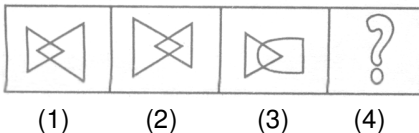


#### Answer Figures

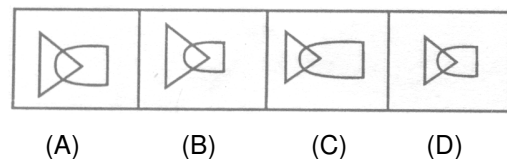


**Sol.** (B) The topmost figure is stationary and rest of the figure change their size and position (In the group of two figures)

#### Ex 11. Problem Figures



#### Answer Figures



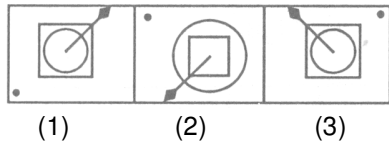
**Sol.** (B) Let figure (triangle) becomes bigger and right figure (triangle) becomes smaller.

**TYPE IV :**

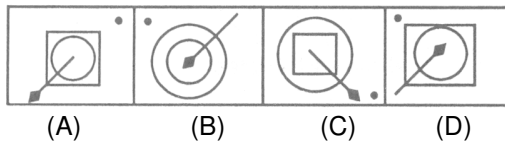
**Multi-Relational Series :**

These are mixed series in which various elements in diagrams increase/decrease in number, change/positions in a set pattern.

**Ex 12. Problem Figures**

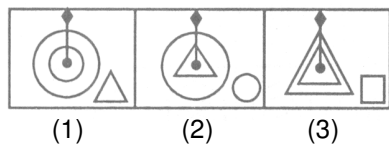


**Answer Figures**

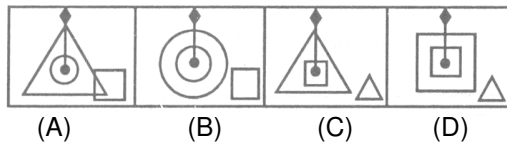


**Sol.** (C) Note movement of dot which is clockwise and the arrow moves in and out in opposite direction, the circle and square interchange

**Ex 13. Problems Figures**

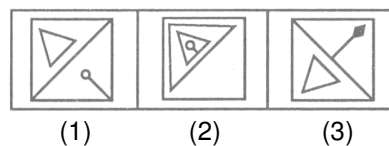


**Answer Figures**

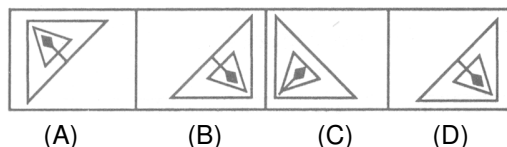


**Sol.** (C) The bottom figure changes its position with the figures in the centre to the big circle, and rest of the figure remains unchanged.

**Ex 14. Problem Figures**



**Answer Figures**

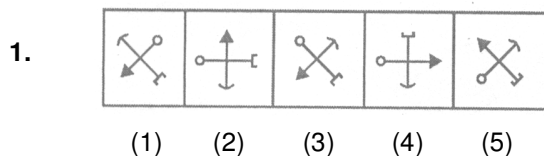


**Sol.** (C) The half with triangle remains stationary and other half is superimposed on the first half without changing direction.

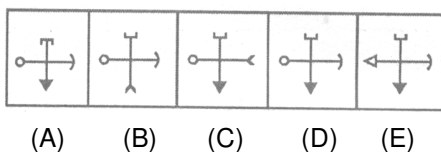
## PRACTICE EXERCISE

**Directions : (1 to 6) Each of the following questions consists of five figures marked 1, 2, 3, 4 and 5. These figures form a series. Find out the one from the answer figures that will continue the series.**

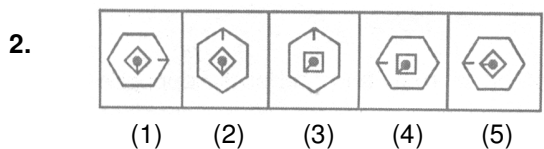
### Problems Figures



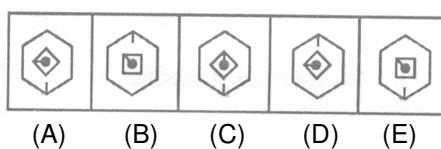
### Answer Figures



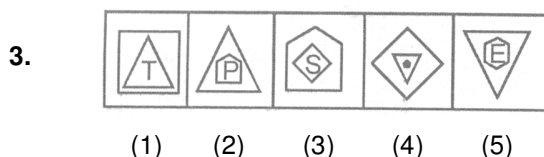
### Problem Figures



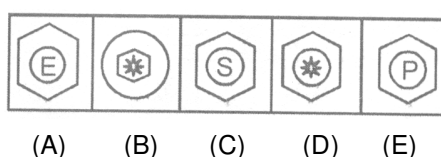
### Answer Figures



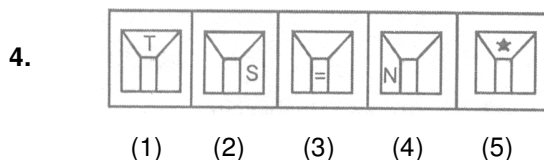
### Problem Figures



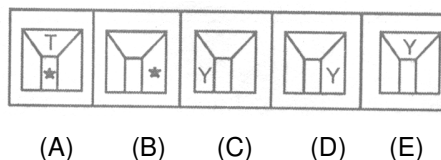
### Answer Figures



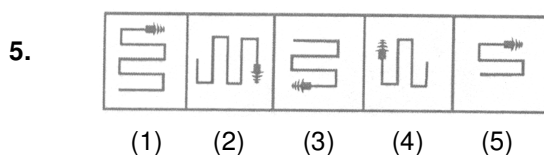
### Problem Figures



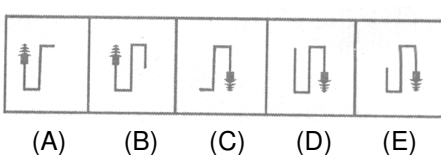
### Answer Figures



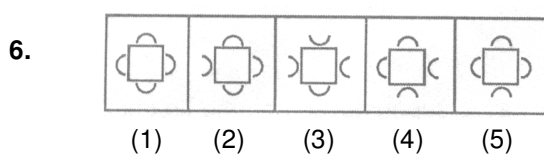
### Problem Figures



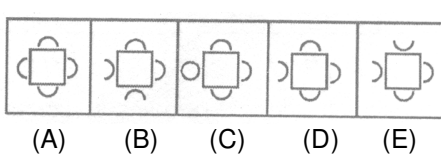
### Answer Figures



### Problem Figures



### Answer Figures





**Directions : (7 to 11)** Each of the following questions consist of five figures marked 1, 2, 3, 4 and 5 called the Problem Figures followed by five other figures marked A, B, C, D and E called the Answer Figures. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.

**7.**

(1)	(2)	(3)	(4)	(5)

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

**8.**

(1)	(2)	(3)	(4)	(5)

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

**9.**

(1)	(2)	(3)	(4)	(5)

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

**10.**

(1)	(2)	(3)	(4)	(5)

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

**11.**

(1)	(2)	(3)	(4)	(5)

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

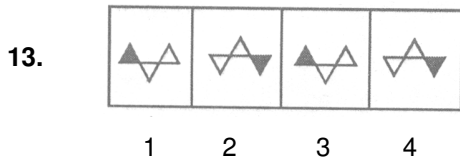
**Directions: (12 to 16)** Each of the following problems, contains four Problem Figures marked 1, 2, 3, and 4 and five Answer Figure marked A, B, C, D and E. Select a figure from amongst the Answer figures which will continue the same series as given in the Problem Figures.

**12.**

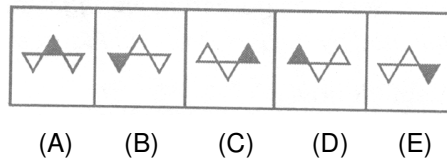
(1)	(2)	(3)	(4)

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

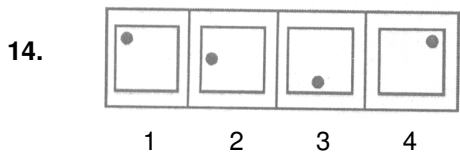
**Problem Figures**



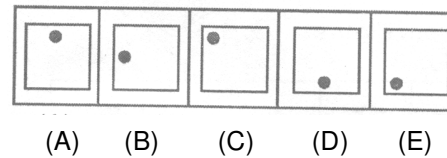
**Answer Figures**



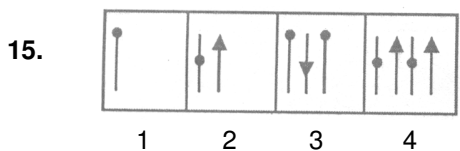
**Problem Figures**



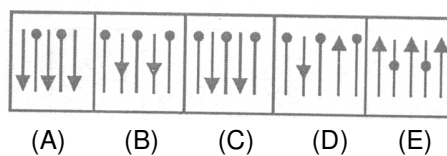
**Answer Figures**



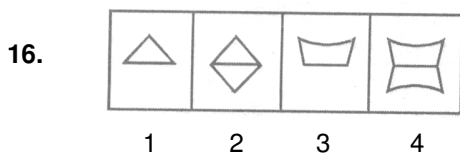
**Problem Figures**



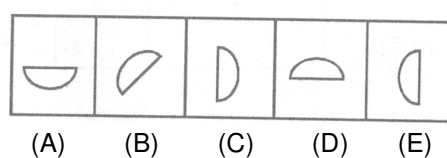
**Answer Figures**



**Problem Figures**

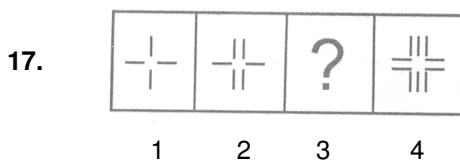


**Answer Figures**

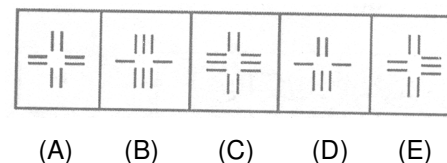


**Directions :** (17 to 21) In each of the following questions, there is a set of four figures labelled 1, 2, 3 and 4 called Problem Set followed by a set of five other figures labelled A, B, C, D and E called Answer Set. Figure (3) contains a question mark. Select a suitable figure from the Answer set which will substitute this question-mark so that a series is formed by the figures 1, 2, 3 and 4 taken in order. The letter of the selected figure is the answer.

**Problem Figures**

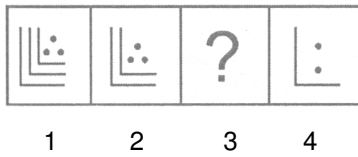


**Answer Figures**

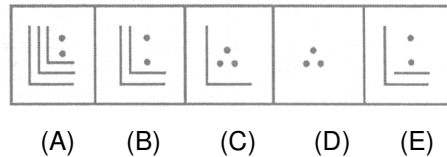


**Problem Figures**

18.

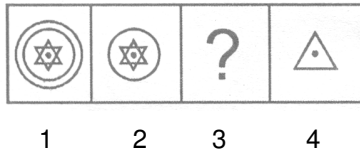


**Answer Figures**

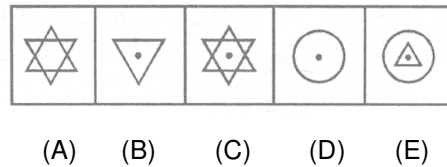


**Problem Figures**

19.

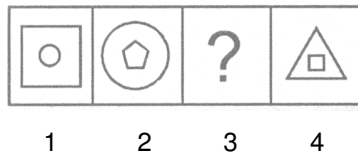


**Answer Figures**

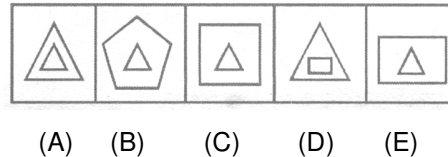


**Problem Figures**

20.

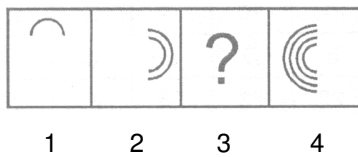


**Answer Figures**

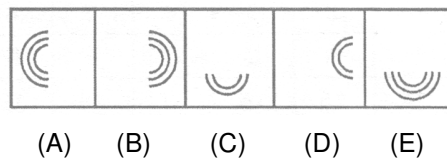


**Problem Figures**

21.

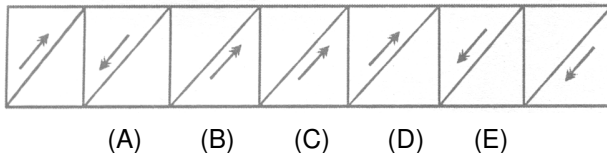


**Answer Figures**

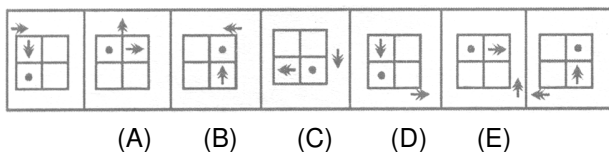


**Directions :** (22 to 26) In each of the following questions, there are five numbered figures and two un-numbered figures on the extremes. These seven figures form a series. However, one of the five numbered figures does not fit into the series. The number of that figure is the answer.

22.



23.

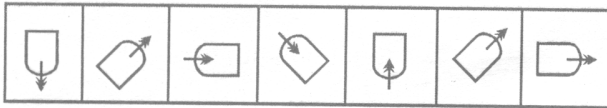


24.



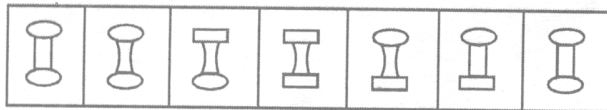
(A) (B) (C) (D) (E)

25.



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

26.



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

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	D	A	D	D	E	D	E	D	E	D	E	C	D
Que.	14	15	16	17	18	19	20	21	22	23	24	25	26
Ans.	E	B	D	A	B	C	B	E	B	E	C	D	E

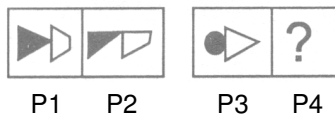


# ➤➤➤ NON - VERBAL <<<< ANALOGY & CLASSIFICATION

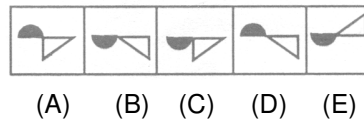
## **ANALOGY :**

In this type, the problem Figures are presented in two units. The first unit contains two figures, one in each square. The second unit contains one figure in the first square and a question mark (?) in the second you have to find out from among the figures A, B, C, D and E as to which one should replace the questions mark after finding the relationship between the two figures in the first unit of the problem figures. Some examples are discussed below.

### **Ex 1. Problem Figure**

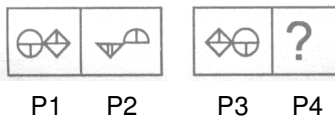


### **Answer Figure**

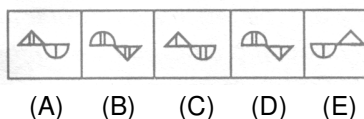


**Sol.** (C) P2 contains the lower half of P1. Hence, answer figure C replaces the question mark.

### **Ex 2. Problem Figure**

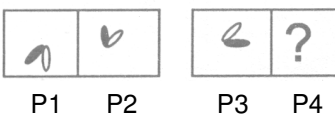


### **Answer Figure**

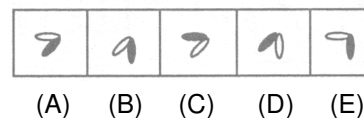


**Sol.** (E) The lower LHS figure of portion in P1 becomes the upper portion in P2, shifted to the other side. Similarly RHS figure of the upper portion in P1 becomes the lower portion P2 shifted to the other side with one vertical line therein. The other two halves are deleted.

### **Ex 3. Problem Figure**



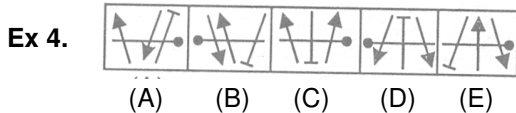
### **Answer Figure**



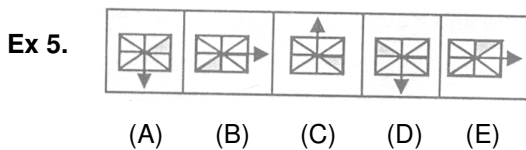
**Sol.** (A) P1 is rotated 180° ACW or CW to obtain P2. Then the shaded and the unshaded leaves are interchanged. Hence, (A) should replace the question mark.

### CLASSIFICATION :

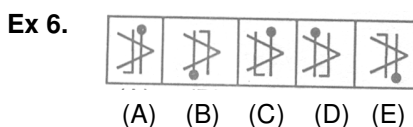
In these type of questions, five figures numbered (A), (B), (C), (D) and (E) given. These are treated both problem Figures as well as the Answer figures. Four out of these five figures are related to each other by way of having some common characteristics and so form a group. Out of these five, you have to identify one figure which does not belong to group.



**Sol.** (C) Both the arrow heads are in the same direction in figure (C). In all other figures, they are in the opposite direction, Hence, (C) is the answer



**Sol.** (E) Between the shaded portion and the arrow, there are two triangles in figure (A), (B), (C) and (D).

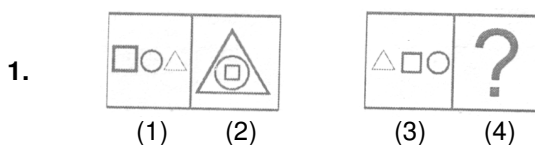


**Sol.** (C) Figures (A) and (D) form a group. The bars are interchanged here. Similarly, figure (B) and (D). Hence (C) is the odd one out.

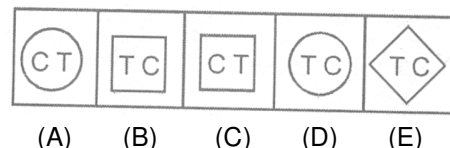
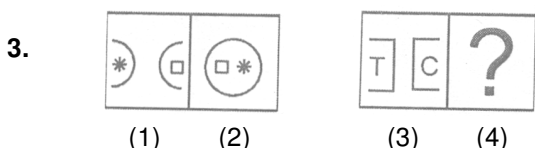
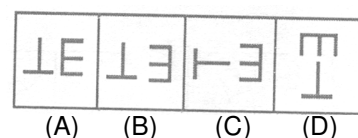
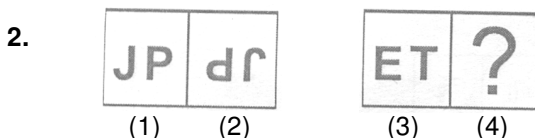
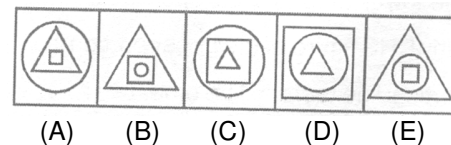
## PRACTICE EXERCISE

**Directions :** (1 to 11) Figures 1' and 2 are related in a particular manner. Establish the same relationship between figures 3 and 4 by choosing a figure from amongst the five alternatives, which would replace the question mark in figure (4).

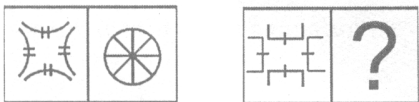

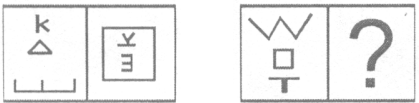

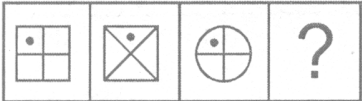
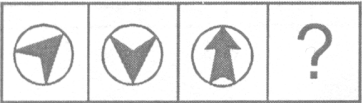
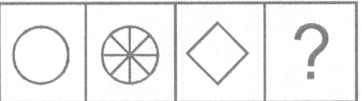
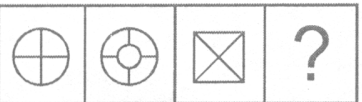
### Problem Figure




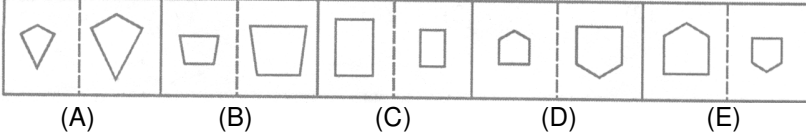

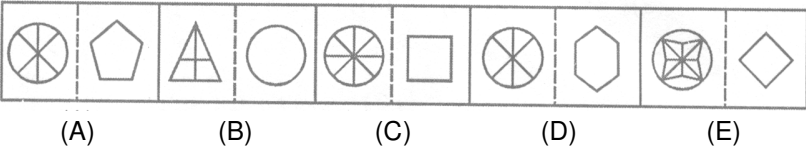
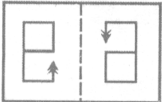
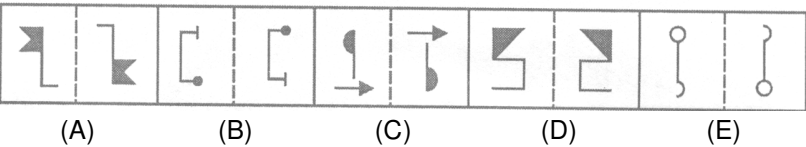
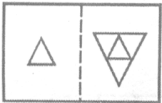
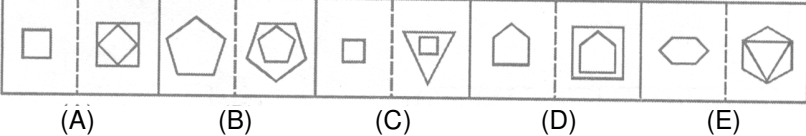
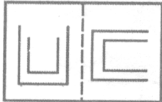
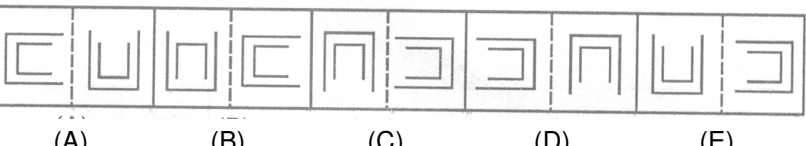
### Answer Figure



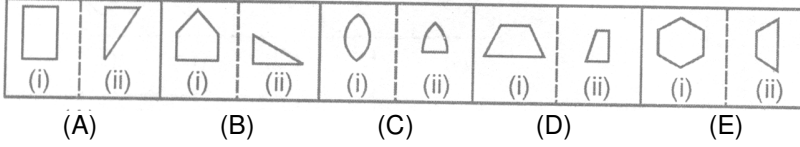
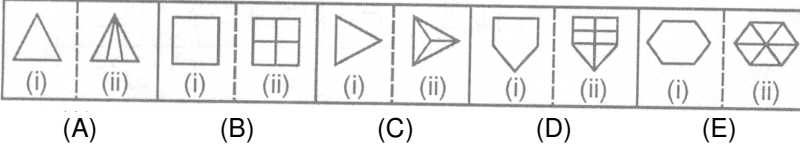


4.   
 (1) (2) (3) (4)
5.   
 (1) (2) (3) (4)
6.   
 (1) (2) (3) (4)
7.   
 (1) (2) (3) (4)
8.   
 (1) (2) (3) (4)
9.   
 (1) (2) (3) (4)
10.   
 (1) (2) (3) (4)
11.   
 (1) (2) (3) (4)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)
- (A) (B) (C) (D) (E)

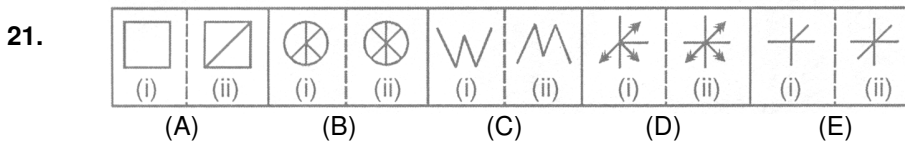
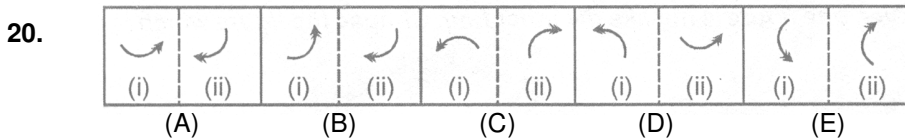
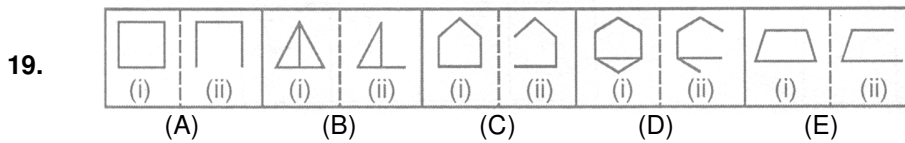
**Directions : (12 to 16)** In each of the following problems, a related pair of figures is followed by five numbered pairs of figures. Select the pair that has a relationship similar to that in the original pair.

12.  (X) 
13.  (X) 
14.  (X) 
15.  (X) 
16.  (X) 

**Directions : (17 to 21)** In each of the following questions, in four out of the given five pairs five pairs of figures, the first element is related to the second element in the same particular manner. Spot out the pair in which the relationship does not exist between the figures.

17. 
18. 

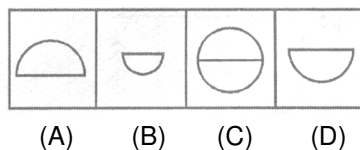
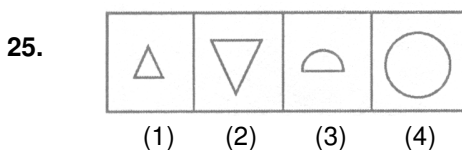
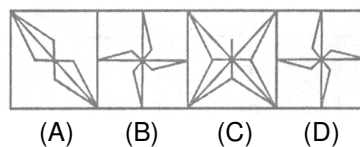
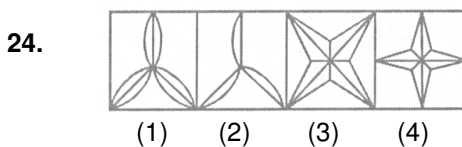
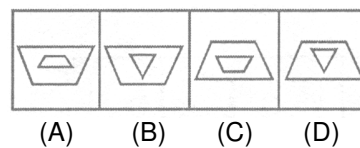
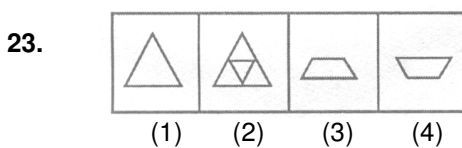
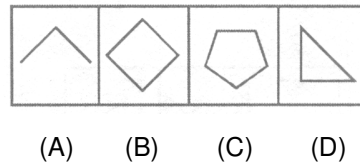
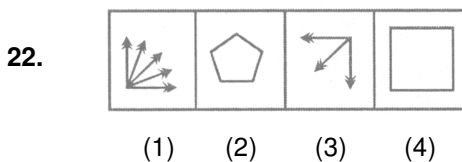




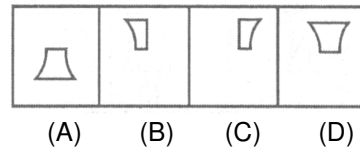
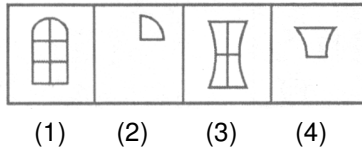
**Directions :** (22 to 26) Each of the following questions bears four figure numbered 1, 2, 3 and 4 which constitute the Problem Set and four other figures numbered A, B, C and D which constitute the Answer Set. Figures 1 and 2 are related in a particular way. Establish a similar relationship between figures 3 and 4 by choosing a figure from the Answer set that would best substitute figure (4) in the Problem set. In case if none of the figures of the Answer set is suitable then answer is E.

**Problem Figure**

**Answer Figure**

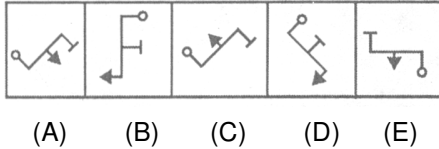


26.

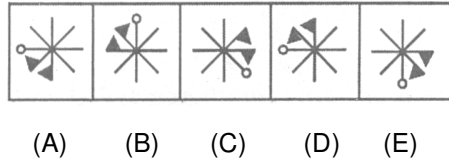


**Directions :** (27 to 41) Out of the five figures (A), (B), (C), (D) and (E), given in each problem, four are similar in a certain way. However, one figure is not like the other four. Choose the figure which is different from the rest.

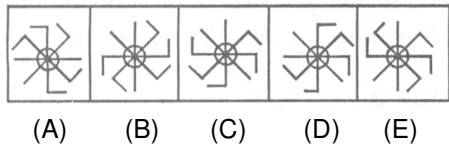
27.



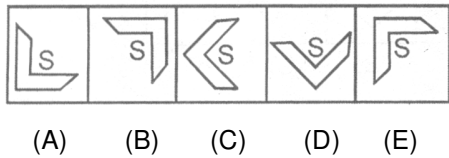
28.



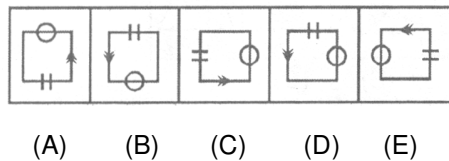
29.



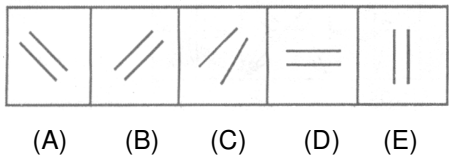
30.



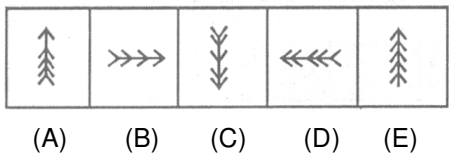
31.



32.



33.



- (A)      (B)      (C)      (D)      (E)

- (A)      (B)      (C)      (D)      (E)

- (A)      (B)      (C)      (D)

- (A)      (B)      (C)      (D)      (E)

- (A)      (B)      (C)      (D)

- (A)      (B)      (C)      (D)      (E)

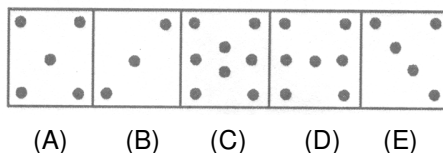
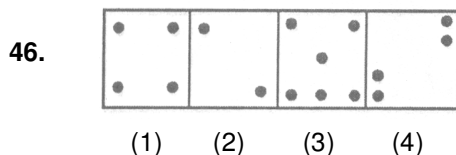
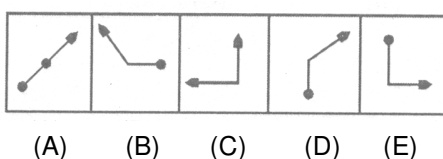
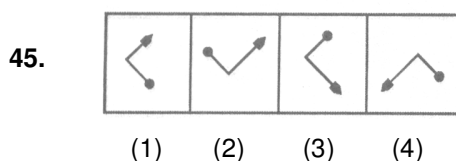
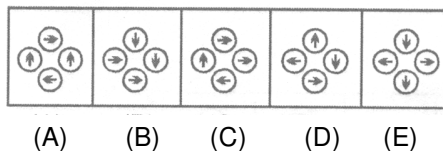
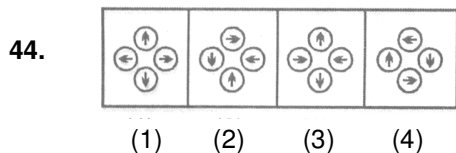
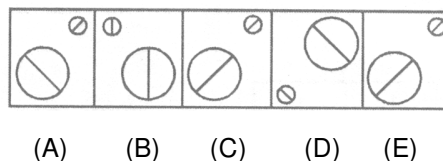
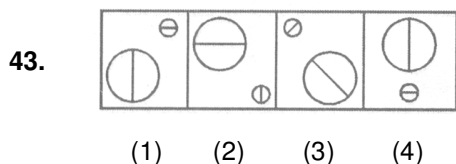
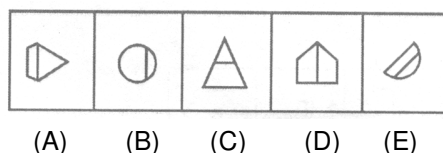
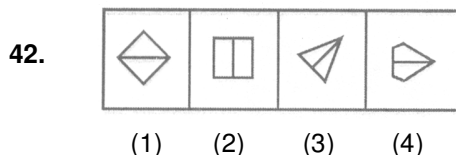
- (A)      (B)      (C)      (D)      (E)

- (A)      (B)      (C)      (D)      (E)

**Directions :** (42 to 46) The following problems contain four numbered figures (1, 2, 3 and 4) forming the Problem Set and five numbered figures (A, B, C, D & E) forming the Answer Set. The four Problem figures have certain common features. Select a figures from amongst the Answer Figures which is similar to the Problem Figures.

Problem Figure

Answer Figure



## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	C	B	C	C	B	B	E	E	D	A	A	D
Que.	13	14	15	16	17	18	19	20	21	22	23	24
Ans.	A	A	B	C	B	D	D	C	C	D	C	A
Que.	25	26	27	28	29	30	31	32	33	34	35	36
Ans.	D	C	A	D	D	C	D	C	B	E	D	D
Que.	37	38	39	40	41	42	43	44	45	46		
Ans.	B	A	B	B	E	D	A	D	E	C		

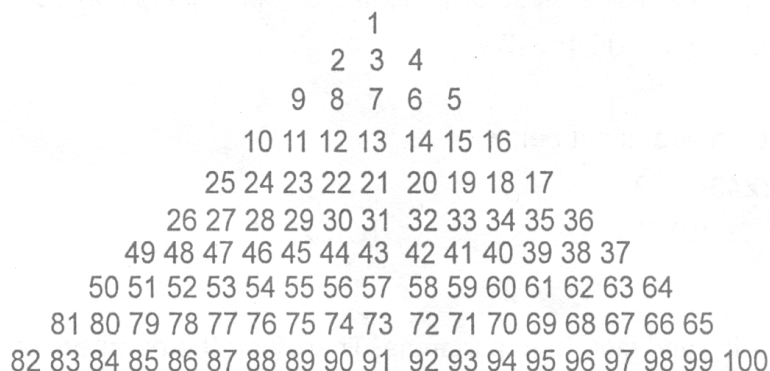


## PYRAMIDS & MISCELLANEOUS



### PYRAMIDS :

**Brief review of concepts :** The questions in this unit are based on the pyramid of numbers form 1 to 100, as given below.



Many types of questions are possible based on the above pattern from instance, formation of parallel lines, perpendicular lines, triangles, squares, etc. by taking numbers in order.

**Type 1** Fill the blanks from the choice given below.

129 : 145 :: 3811 : ?

(A) 3713

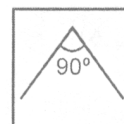
(B) 328

(C) 346

(D) 3614

(E) 3615

There are two groups of numbers. The numbers on the right hand side must have the same relation as the numbers on the left hand side. 129 and 145, in the above pyramid, form a pattern.



Hence the number in the blank on the right hand side must form same pattern with 3811. Therefore, the answer is 3615 which forms the pattern.



**Type 2** Fill the blank from the choice given below.

2812 : 965 :: 91123 : ?

(A) 121110

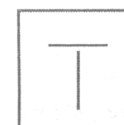
(B) 121314

(C) 122132

(D) 303132

(E) 122230

The two numbers on the left hand side form perpendicular lines in the pyramid. Therefore, the numbers on the right hand side must be of the same pattern. The answer to the above question should be (B) 121314 to satisfy the same relation.



**Type 3** Fill the blank from the choice given below.

234 : 4614 :: 2812 : ?

(A) 3713

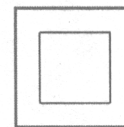
(B) 34614

(C) 121314

(D) 131415

(E) 122239

The numbers on the left-hand side form two sides of a square. The numbers have been chosen in continuity. 2812 and 121314 are in continuity and form the other two sides of the same square. hence the answer is (C).



**Type 4** Fill the blank from the choice given below.

507986 : 772112 :: 537689 : ?

(A) 745742

(B) 735841

(C) 716039

(D) 755643

(E) 775543

Hence two numbers on the left-hand side form perpendicular lines. Therefore, the numbers on the right-hand side must form the same point, taking numbers in order. Hence the answer is (A) 745742.



**Type 5** Fill the blank from the choice given below.

322120 : 321920 :: 324342 : ?

(A) 324142

(B) 324132

(C) 323143

(D) 323319

(E) 324133

The numbers on the left-hand side form a triangle. Therefore, the numbers on the right-hand side must form a triangle with common point 32. Hence, the answer is (A) 324142.

### MISCELLANEOUS :

**Ex 1.** Select a figure from the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.



(X)



(A)



(B)



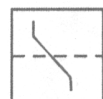
(C)



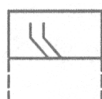
(D)

**Sol.** (D) Clearly, figure (D) will complete the pattern when placed in the blank space of figure (X) as shown below.

**Ex 2.** In the following questions problems, a square transparent sheet with a pattern is given. Figure out from amongst four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



(X)



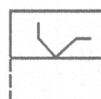
(A)



(B)



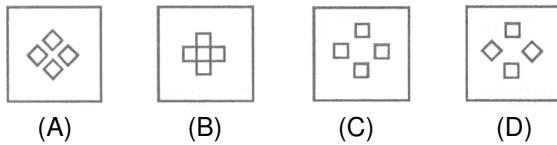
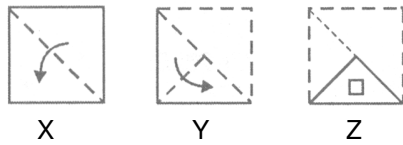
(C)



(D)

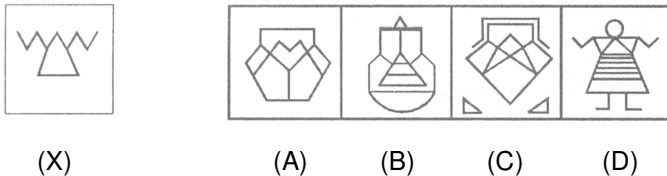
**Sol.** (B) Clearly, the lower half of the square sheet has been folded over the upper half. Hence, the bent line in the lower half will be inverted over the other half so that a 'V' shaped figure is formed.

**Ex 3.** Consider the following three figures, marked X, Y, Z showing one fold in X, another in Y and cut in Z. From amongst the answer figures A, B, C, and D, select the one, showing the unfolded position of Z.



**Sol.** (C) In figure X, the upper triangular half of the paper has been folded over the lower half. In figure Y, the paper is refolded to a quarter triangle. In figure Z, a square has been punched in the folded paper. Clearly, the square will appear in each of the four triangular quarters of the paper. Thus, when the paper is unfolded, four squares will appear symmetrically over it and it will resemble figure (C).

**Ex 4.** In the following question, choose the alternative figure in which the question figure (X) is embedded.



**Sol.** (D) It is clear from the alternative figures that figure (X) is embedded in Figure (D)

## PRACTICE EXERCISE

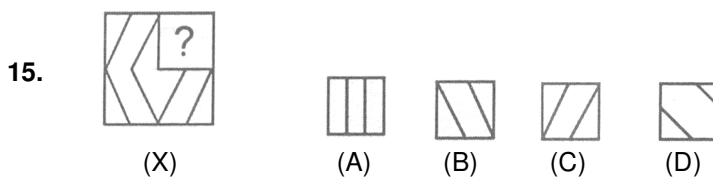
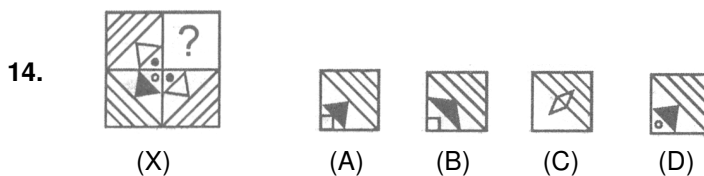
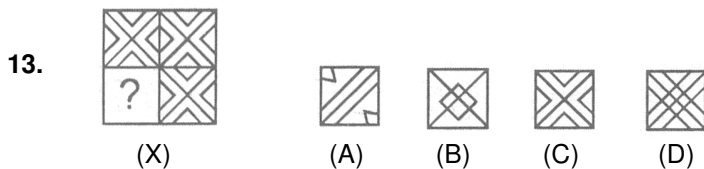
**Directions : (1 to 12) Fill the blanks in the following questions from the choice given below. Which are based on pyramids.**

- 192021 : 213241 :: 414243 : ?  
 (A) 433023 (B) 435871 (C) 414039 (D) 435773
- 494852 : 818084 :: 101123 : ?  
 (A) 121321 (B) 494852 (C) 252428 (D) 262747
- 432946 : 443241 :: ? : 706267  
 (A) 725675 (B) 695972 (C) 705873 (D) 696366
- 171210 : 31311 :: 19415856 : ?  
 (A) 335957 (B) 333342 (C) 333460 (D) 325961



5. 161933 : 425774 :: 132131 : ?  
 (A) 435675 (B) 445576 (C) 455477 (D) 304554
6. 3812 : 3614 : 284753 : ?  
 (A) 284654 (B) 282930 (C) 294456 (D) 284555
7. 151835 : 193439 :: 274655 : ?  
 (A) 274654 (B) 465674 (C) 475475 (D) 455673
8. 324356 : 324160 :: 425774 : ?  
 (A) 425970 (B) 425971 (C) 423122 (D) 322112
9. 474849 : 495277 :: 777879 : ?  
 (A) 795149 (B) 795247 (C) 527978 (D) 525377
10. 56443022 : 131415 :: 18344060 : ?  
 (A) 604132 (B) 595857 (C) 717273 (D) 606162
11. 252845 : 274655 :: 264754 : ?  
 (A) 102330 (B) 495277 (C) 485376 (D) 262510
12. 767574 : 564430 :: 899091 : ?  
 (A) 929394 (B) 917357 (C) 765446 (D) 735743

**Directions : (13 to 20) Select a figure from the alternatives which when placed in the blank space of (x) would complete the pattern ?**





16.



(X)



(A)



(B)

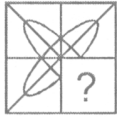


(C)



(D)

17.



(X)



(A)



(B)

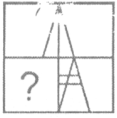


(C)



(D)

18.



(X)



(A)



(B)

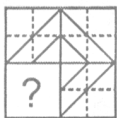


(C)



(D)

19.



(X)



(A)



(B)



(C)



(D)

20.



(X)



(A)



(B)



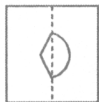
(C)



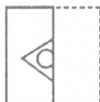
(D)

**Directions : (21 to 25) A square transparent sheet with a pattern is given in figure X. Find out from amongst the alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.**

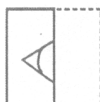
21.



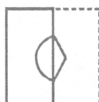
(X)



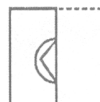
(A)



(B)

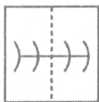


(C)

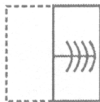


(D)

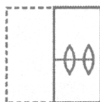
22.



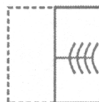
(X)



(A)



(B)

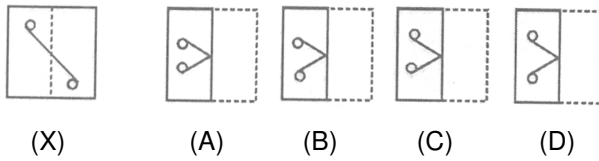


(C)

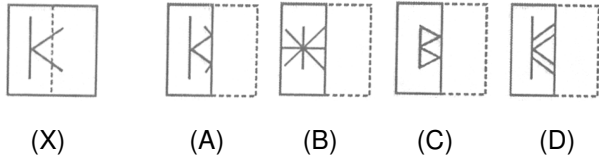


(D)

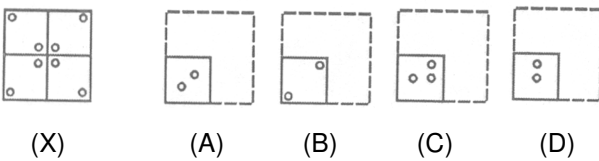
23.



24.

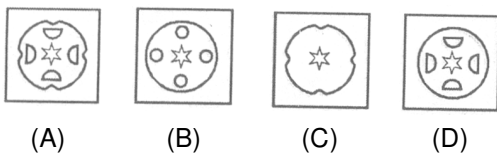
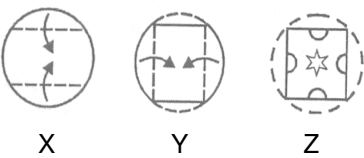


25.

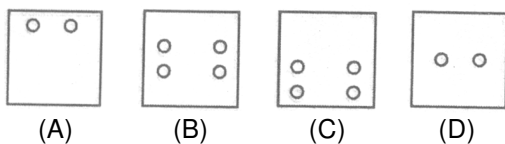
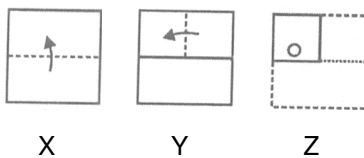


**Directions : (26 to 32) A sheet has been folded in the manner as shown is X, Y and Z respectively and punched. You have to choose from the alternatives how it will look when unfolded.**

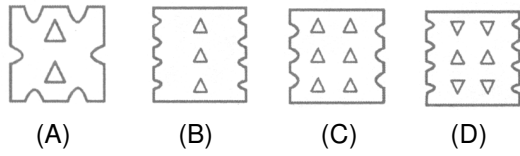
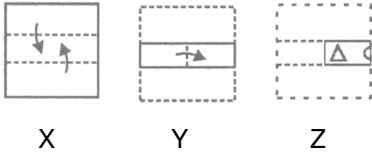
26.



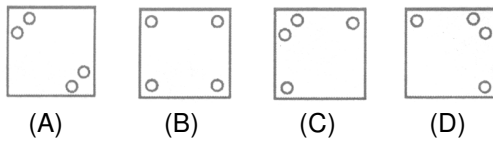
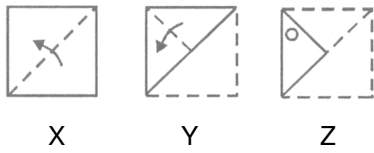
27.



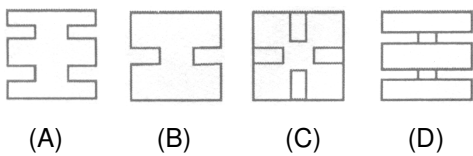
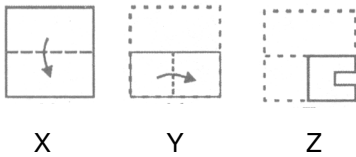
28.



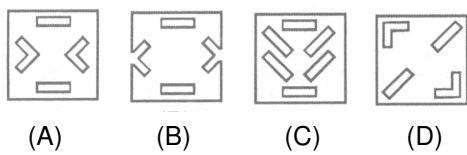
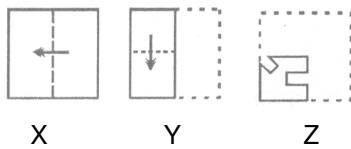
29.



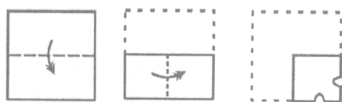
30.



31.



32.



X

Y

Z



(A)

(B)

(C)

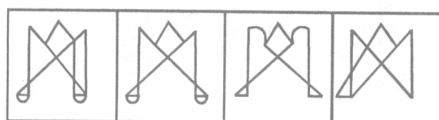
(D)

**Direction : (33 to 36) In each of the following questions, choose the alternative figure in which the question figure (X) is embedded.**

33.



(X)



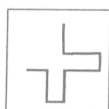
(A)

(B)

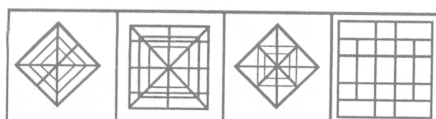
(C)

(D)

34.



(X)



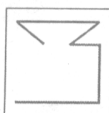
(A)

(B)

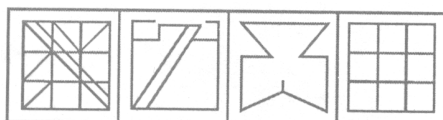
(C)

(D)

35.



(X)



(A)

(B)

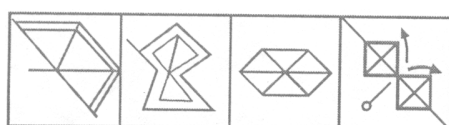
(C)

(D)

36.



(X)



(A)

(B)

(C)

(D)

## ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	B	D	B	A	B	D	C	A	B	C	C	D
Que.	13	14	15	16	17	18	19	20	21	22	23	24
Ans.	C	D	B	A	D	A	C	A	D	B	D	A
Que.	25	26	27	28	29	30	31	32	33	34	35	36
Ans.	B	B	B	D	A	A	B	A	B	D	A	D