

## SECTION I : LOGICAL REASONING

1. How many odd numbers are there in the given sequence which are immediately followed by an odd 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) 3                                      (B) 4                                      (C) 5                                      (D) 6

2. How many combinations of two-digit numbers having 8 can be made from the following numbers?

8, 5, 2, 1, 7, 6

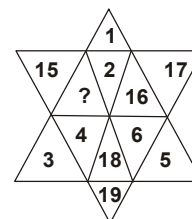
- (A) 9                                      (B) 10                                      (C) 11                                      (D) 12

3. If Z = 26, NET = 39, then NUT = ?

- (A) 50                                      (B) 53                                      (C) 55                                      (D) 56

4. Find the missing character in the given question.

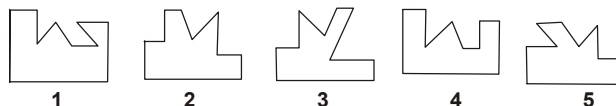
- (A) 13  
(B) 14  
(C) 25  
(D) 21



5. Which one of the given Venn diagrams correctly illustrate the relationship among the following: "Plums, Tomatoes, Fruits" ?



6. In the given question, five figures marked 1, 2, 3, 4 and 5 are given. From these five figures, we can get two pairs of figures such that each pair forms a complete square. You have to select the odd figure which does not fit into any of the other figures to form a complete square.

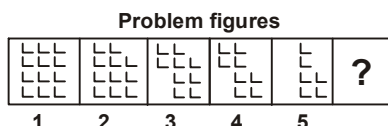


- (A) 1                                      (B) 3                                      (C) 4                                      (D) 5

7. If the letters in the word **UNDERTAKING** are rearranged in the alphabetical order, which one will be in the middle in order after the rearrangement ?

- (A) G                                      (B) I                                      (C) K                                      (D) N

8. The given question consists of five figures marked 1, 2, 3, 4 and 5 called the Problem figures. Select the figure from amongst the alternatives, which will continue the same series as established by the five Problem figures.



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

9. In a certain code language, 'po ki top ma' means 'Usha is playing cards', 'kop ja ki ma' means 'Asha is playing tennis', 'ki top sop ho' means 'they are playing football' and 'po sur kop' means 'cards and tennis'. Which word in that language means 'Asha'?

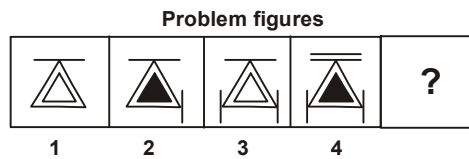
- (A) ja (B) ma (C) kop (D) top

10. In the given question, a set of figures carry certain characters. Assuming that the characters in each set follow a similar pattern, find the missing character.

84		81		88	
14	12	18	9	?	11

- (A) 16 (B) 21 (C) 61 (D) 81

11. The given question contains four Problem figures marked as 1, 2, 3 and 4. Select a figure from amongst the options which will continue the series established by the four Problem figures.



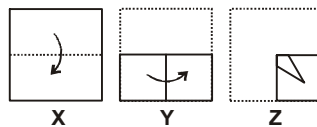
- (A) (B) (C) (D)

12. Find a missing term (?) in the following series.

AZ, GT, MN, ?, YB

- (A) JH (B) SH (C) SK (D) TS

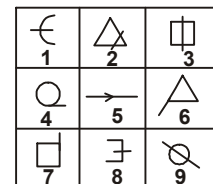
13. The given question consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. These three figures are followed by four options from which you have to choose a figure which would most closely resemble the unfolded form of fig. (Z).



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

14. Group the given figures into three classes, using each figure only once.

- (A) 1, 3, 9; 2, 5, 8; 4, 6, 7  
 (B) 1, 5, 8; 4, 6, 7; 2, 3, 9  
 (C) 4, 5, 9; 1, 3, 8; 2, 6, 7  
 (D) 1, 8, 9; 4, 6, 7; 2, 3, 5



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

- (A) 19 (B) 20 (C) 21 (D) 22

16. In a certain code language, 15729 is written as AEGBI and 2346 is written as BCDF, then how will 23549 be written in that language ?

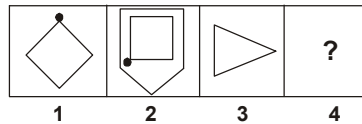
- (A) ABEDI                      (B) CBEDI                      (C) BCEDI                      (D) CEBDI

17. If  $A > B$ ,  $B > C$  and  $C > D$ , then which of the following conclusions is definitely wrong ?

- (A)  $A > D$                       (B)  $A > C$                       (C)  $D > A$                       (D)  $B > D$

18. The given question consists of figures 1, 2, 3 and 4 which constitute the Problem Set. There is a definite relationship between figures 1 and 2. Establish a similar relationship between figures 3 and 4 by selecting a suitable figure from the alternatives that would replace the question mark (?) in Fig. (4).

Problem Set



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

**DIRECTION (19-20) :** The letter-group in each of these questions is to be coded as per the following number codes :

Letters	L	T	P	M	R	D	H	F	K	V
Number codes	3	0	4	9	2	1	5	7	6	8

Find out which of the following alternatives has the correct coded form of the given letter-group.

19. DHFMTRV

- (A) 1579082                      (B) 1579028                      (C) 1570982                      (D) 1570928

20. KHVLRDP

- (A) 6853214                      (B) 6853124                      (C) 6583214                      (D) 6538214

**SECTION II : MATHEMATICAL REASONING**

21. The next term of the geometric progression  $x, x^2 + 2, x^3 + 10$ , is \_\_\_\_.

- (A) 0                      (B) 6                      (C)  $729/16$                       (D) 52

22. A (1, 3) and C (7, 5) are two opposite vertices of a square. The equation of a side through A is \_\_\_\_.

- (A)  $x + 2y - 7 = 0$                       (B)  $x - 2y + 5 = 0$                       (C)  $2x + y - 5 = 0$                       (D)  $2x - y + 2 = 0$

23. The eccentricity of an ellipse, with its centre at origin is  $\frac{1}{2}$ . If one of the directrices is  $x = 4$ , then the equation of the ellipse is \_\_\_\_.

- (A)  $3x^2 + 4y^2 = 1$                       (B)  $3x^2 + 4y^2 = 12$                       (C)  $4x^2 + 3y^2 = 12$                       (D)  $4x^2 + 3y^2 = 1$

24. Let  $\alpha$  and  $\beta$  be the roots of the equation  $x^2 + x + 1 = 0$ . The equation whose roots are  $\alpha^{19}, \beta^7$  is \_\_\_\_.

- (A)  $x^2 - x - 1 = 0$                       (B)  $x^2 - x + 1 = 0$                       (C)  $x^2 + x - 1 = 0$                       (D)  $x^2 + x + 1 = 0$

25. If  $\omega$  is the cube root of unity, then  $\tan \left\{ \left( \omega^{200} + \frac{1}{\omega^{200}} \right) \pi + \frac{\pi}{4} \right\}$  equals \_\_\_\_.
- (A) 1 (B)  $\frac{1}{\sqrt{2}}$  (C) 0 (D) 2
- 
26. If  $\lim_{x \rightarrow k} \frac{x^k - 5^k}{x - 5} = 500$ , then positive value of  $k$  is \_\_\_\_.
- (A) 3 (B) 4 (C) 5 (D) 6
- 
27. Which of the following is a prime number ?
- (A) 370261 (B) 1003 (C) 73271 (D) 667
- 
28. Middle term in the expansion of  $(1 - 3x + 3x^2 - x^3)^{2n}$  is \_\_\_\_.
- (A)  $\frac{6n!}{3n!3n!} x^n$  (B)  $\frac{6n!}{3n!} x^{3n}$  (C)  $\frac{6n!}{3n!3n!} (-x)^{3n}$  (D) None of these
- 
29. If  $\binom{10}{x-1} > 2 \binom{10}{x}$ , then
- (A)  $x \in [2, 9]$  (B)  $x = 8, 9, 10$  (C)  $[6, 10]$  (D) None of these
- 
30. If  $X = \{8^n - 7n - 1; n \in N\}$  and  $Y = \{49(n-1) : n \in N\}$  then
- (A)  $X \subseteq Y$  (B)  $Y \subseteq X$  (C)  $X = Y$  (D) None of these
- 
31. The probability that in a random arrangement of the letter of the word "FAVOURABLE" the two A's do not come together is \_\_\_\_.
- (A)  $\frac{1}{5}$  (B)  $\frac{1}{10}$  (C)  $\frac{9}{10}$  (D)  $\frac{4}{5}$
- 
32. The given expression  $f(x) = \frac{1}{\tan x + \cot x + \sec x + \operatorname{cosec} x}$  equivalent to
- (A)  $\frac{1}{2(\sin x + \cos x - 1)}$  (B)  $\frac{\sin x + \cos x - 1}{2}$  (C)  $\frac{1}{2(\sin x - \cos x + 1)}$  (D)  $\frac{\sin x - \cos x + 1}{2}$
- 
33. The domain of the function  $f(x) = \sqrt{4x - 3} + \sqrt{2x - 6}$  is \_\_\_\_.
- (A)  $[0, \infty)$  (B)  $\left[ \frac{3}{4}, \infty \right)$  (C)  $\left[ \frac{4}{3}, \infty \right)$  (D)  $[3, \infty)$
- 
34. There are 15 bulbs in a room. Each one of them can be operated independently. The number of ways in which the room can be lighted is \_\_\_\_.
- (A)  $8^5 + 1$  (B)  $(32)^2 - 1$  (C)  $(32)^3 - 1$  (D) None of these.
- 
35. If  $n \in N$  and  $C_r, C_{r-1}, C_{r-2}$  have their usual meanings, then the value of the expression  ${}^{n-2}C_r + 2 {}^{n-2}C_{r-1} + {}^{n-2}C_{r-2}$  equals \_\_\_\_.
- (A)  ${}^{n-2}C_{r-2}$  (B)  ${}^nC_{r-1}$  (C)  ${}^{n-1}C_{r-1}$  (D)  ${}^nC_r$
- 
36. The circumcentre of the triangle, whose vertices are  $(0, 0), (4a, 0), (0, 6a)$  is \_\_\_\_.
- (A)  $(2a, 0)$  (B)  $(0, 3a)$  (C)  $(3a, 0)$  (D)  $(2a, 3a)$
-

37.  $\lim_{x \rightarrow 0} \frac{xy\sqrt{y^2 - (y-x)^2}}{(\sqrt{8xy} - 4x^2 + \sqrt{8xy})^3}$  equals \_\_\_\_\_.

- (A)  $\frac{1}{512}$  (B)  $\frac{1}{128}$  (C)  $\frac{1}{64}$  (D) None of these

38. If  $x = 0.\overline{5}$  is a rational number, then  $x$  equals \_\_\_\_.

- (A)  $\frac{3}{9}$  (B)  $\frac{5}{9}$  (C)  $\frac{2}{9}$  (D)  $\frac{4}{9}$

39. The value of  $3 \tan^6 10^\circ - 27 \tan^4 10^\circ + 33 \tan^2 10^\circ$  equals \_\_\_\_.

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

40. A five digit number be selected at random. The probability that the digits in the odd place are odd and the even places are even (repetition is not allowed) is \_\_\_\_\_.

- (A)  $\frac{{}^5P_2 \times {}^5P_3}{10^4 \times 9}$  (B)  $\frac{{}^5P_2 \times {}^5P_3}{10^5}$  (C)  $\frac{{}^5C_2 \times {}^5C_3}{10^4 \times 9} \times 2$  (D) None of these

### SECTION III : EVERYDAY MATHEMATICS

41. In a survey among 80 people, 50 people like arrange marriage and 70 people like love marriage. What is the minimum and maximum number of people like both the marriages respectively ?

- (A) 40, 45 (B) 40, 50 (C) 30, 40 (D) Can't be determined

42. A man from the top of a 100 metres high tower sees a car moving towards the tower at an angle of  $30^\circ$ . After some time, the angle of depression becomes  $60^\circ$ . The distance (in metres) travelled by the car driving this time is \_\_\_\_ .

- (A)  $100\sqrt{3}$  (B)  $\frac{100\sqrt{3}}{3}$  (C)  $200\sqrt{3}$  (D)  $\frac{200\sqrt{3}}{3}$

43. Ashmit can solve 80% of the problem given in a book and Amisha can solve 70%. What is the probability that at least one of them will solve a problem selected at random from the book ?

- (A) 0.60 (B) 0.06 (C) 0.94 (D) 0.56

44. There are 10 stations on a certain railway line. How many different kinds of tickets of class IInd must be printed in order that a passenger may go from one station to any other by purchasing ticket?

- (A) 90 (B) 45 (C) 135 (D) 100

45. A basket contains 10 apples and 20 oranges out of which 3 apples and 5 oranges are defective. If we choose two fruits at random, what is the probability that either both are oranges or both are non defective ?

- (A)  $\frac{136}{345}$  (B)  $\frac{17}{87}$  (C)  $\frac{316}{435}$  (D)  $\frac{158}{435}$

46. Vibhor joined as an area manager of Quick Corporation in the pay scale of ₹ 12,000 – 500 – 18,500. Minimum how many years he has to work in the corporation to avail the salary of ₹ 18,500 per month?

- (A) 12 years (B) 10 years (C) 13 years (D) 11 years

47. Amit walked 30 metres towards East, took a right turn and walked 40 metres. Then he took a left turn and walked 30 metres. In which direction is he now from the starting point ?  
(A) North-east                      (B) East                              (C) South-east                      (D) South
- 
48. P and his wife Q appear in an interview for two vacancies at the same post. The probability of P's selection is  $\frac{1}{7}$  and that of his wife Q's selection is  $\frac{1}{5}$ . What is the probability that only one of them will be selected ?  
(A)  $\frac{5}{7}$                               (B)  $\frac{1}{5}$                               (C)  $\frac{2}{7}$                               (D)  $\frac{2}{35}$
- 
49. Karan and Arjun run a 100 metre race, where Karan beats Arjun by 10 metres. To do a favour to Arjun, Karan starts 10 metres behind the starting line in a second 100 metre race. They both run at their earlier speeds. Which of the following is true in connection with the second race ?  
(A) Karan and Arjun reach the finishing line simultaneously  
(B) Arjun beats Karan by 1 metre  
(C) Arjun beats Karan by 11 metres  
(D) Karan beats Arjun by 1 metre
- 
50. A new flag has to be designed with six vertical stripes using some or all of the colours, green, blue, pink and red. Then the number of ways in which this can be done such that no two adjacent stripes have the same colour is \_\_\_\_\_.  
(A)  $12 \times 81$                       (B)  $16 \times 192$                       (C)  $20 \times 125$                       (D)  $24 \times 216$
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SPACE FOR ROUGH WORK

