

# ONLINE TEST SERIES

## MCA ENTRANCE EXAMINATION

### NIMCET -6

## Mathematics

1. If two events  $A$  and  $B$  such that  $P(A') = 0.3$ ,  $P(B) = 0.5$  and  $P(A \cap B) = 0.3$ , then  $P\left(\frac{B}{A \cup B'}\right)$  is
- (a)  $\frac{1}{4}$  (b)  $\frac{3}{8}$   
(c)  $\frac{1}{8}$  (d) None of these
2. If  $y = mx$  bisects the angle between the lines  $x^2 (\tan^2 \theta + \cos^2 \theta) + 2xy \tan \theta - y^2 \sin^2 \theta = 0$  when  $\theta = \frac{\pi}{3}$ , then the value of  $\sqrt{3}m^2 + 4m$  is
- (a) 1 (b)  $\frac{1}{\sqrt{3}}$   
(c)  $\sqrt{3}$  (d)  $7\sqrt{3}$
3. If  $f: R \rightarrow R$  and  $g: R \rightarrow R$  and continuous functions, then the value of the integral  $\int_{-\pi/2}^{\pi/2} [f(x) + f(-x)][g(x) - g(-x)] dx$  is
- (a)  $\pi$  (b) 1  
(c) -1 (d) 0
4. The maximum value of  $(\cos \alpha_1)(\cos \alpha_2) \dots (\cos \alpha_n)$  where  $0 \leq \alpha_1, \alpha_2, \dots, \alpha_n \leq \frac{\pi}{2}$  and  $(\cot \alpha_1)(\cot \alpha_2) \dots (\cot \alpha_n) = 1$  is
- (a)  $\frac{1}{2^{n/2}}$  (b)  $\frac{1}{2^n}$   
(c)  $\frac{1}{2n}$  (d) 1
5. Let  $M$  be a point inside the  $\Delta ABC$ . Then, which one of the following is true?
- (a)  $AB + AC < MB + MC$   
(b)  $AB + AC > MB + MC$   
(c)  $AB + AC = MB + MC$   
(d) None of the above
6. A line  $L$  has intercepts ' $a$ ' and ' $b$ ' on the coordinate axes. When the axes are rotated through a given angle, keeping the origin fixed, the same line has intercepts ' $p$ ' and ' $q$ ' which of the following statements is true?
- (a)  $a^2 + b^2 = p^2 + q^2$   
(b)  $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2} + \frac{1}{q^2}$   
(c)  $a^2 + p^2 = b^2 + q^2$   
(d)  $\frac{1}{a^2} + \frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{q^2}$
7. If  $a, b$  are the roots of  $x^2 + px + 1 = 0$  and  $c, d$  are roots of  $x^2 + qx + 1 = 0$  the value of  $E = (a - c)(b - c)(a + d)(b + d)$  is
- (a)  $p^2 - q^2$  (b)  $q^2 - p^2$   
(c)  $q^2 + p^2$  (d) None of these
8. If  $f(x) + f(1-x) = 2$ , then the value of  $f\left(\frac{1}{2001}\right) + f\left(\frac{2}{2001}\right) + \dots + f\left(\frac{2000}{2001}\right)$  is
- (a) 2000 (b) 2001  
(c) 1999 (d) 1998
9. Suppose  $a, b, c$  are in AP with common difference  $d$ . Then,  $e^{1/c}, e^{b/ac}, e^{1/a}$  are in
- (a) AP (b) GP  
(c) HP (d) None of these
10. Let  $\alpha$  and  $\beta$  be the roots of the equation  $x^2 + x + 1 = 0$ . The equation whose roots are  $\alpha^{19}$  and  $\beta^7$  is
- (a)  $x^2 - x - 1 = 0$  (b)  $x^2 + x - 1 = 0$   
(c)  $x^2 - x + 1 = 0$  (d)  $x^2 + x + 1 = 0$
11. In the expression  $(x+1)(x+4)(x+9) \dots (x+16) \dots (x+400)$  the coefficient of  $x^{19}$  is
- (a) 2870 (b) 210  
(c) 4001 (d) 1900
12. The value of  $y = 0.36 \log_{0.25} \left(\frac{1}{3} + \frac{1}{3^2} + \dots\right)$  is
- (a) 0.9 (b) 0.18  
(c) 0.6 (d) 0.25
13. If  $H_1, H_2, \dots, H_n$  are  $n$  harmonic means between  $a$  and  $b$ ,  $a \neq b$ , then the value of  $\frac{H_1 + a}{H_1 - a} + \frac{H_n + b}{H_n - b}$  is equal to
- (a)  $n + 1$  (b)  $n - 1$   
(c)  $2n$  (d)  $2n + 3$
14. For  $a > 0, a \neq 1$ , the number of values of  $x$  satisfying the equation  $2 \log_x(a) + \log_{ax}(a) + 3 \log_{a^2x}(a) = 0$
- (a) 2 (b) 3  
(c) 4 (d) 5

15. An eight digit number divisible by 9 is to be formed by using 8 digits out of the digits 0, 1, ..., 9 without replacement. The number of ways in which this can be done is  
 (a) 9! (b) 2(7!)  
 (c) 4(7!) (d) 36(7!)
16. The number of ordered pairs  $(m, n)$ ,  $m, n \in \{1, 2, \dots, 100\}$  such that  $7^m + 7^n$  is divisible by 5 is  
 (a) 1250 (b) 2000  
 (c) 2500 (d) 5000
17. If  $a, b, c$  are the roots of the equation  $x^3 - 3px^2 + 3qx - 1 = 0$ , then the centroid of the triangle with vertices  $(a, \frac{1}{a})$ ,  $(b, \frac{1}{b})$  and  $(c, \frac{1}{c})$  is at the point  
 (a)  $(p, q)$  (b)  $(\frac{p}{3}, \frac{q}{3})$   
 (c)  $(p+q, p-q)$  (d)  $(3p, 3q)$
18. Equation of the common tangent touching the circle  $(x-3)^2 + y^2 = 9$  and the parabola  $y^2 = 4x$  above the x-axis is  
 (a)  $\sqrt{3}y = 3x + 1$   
 (b)  $\sqrt{3}y = -(x+3)$   
 (c)  $\sqrt{3}y = x + 3$   
 (d)  $\sqrt{3}y = -(3x+1)$
19. The number of roots of the equation  $|x^2 - x - 6| = x + 2$  is  
 (a) 2 (b) 3  
 (c) 4 (d) None of these
20. A pair of unbiased dice is rolled together till a sum of either 5 or 7 is obtained. The probability that 5 comes before 7 is  
 (a) 3/5 (b) 2/5  
 (c) 4/5 (d) None of these
21. A letter is taken at random from the letters of the word 'STATISTICS' and another letter is taken at random from the letters of the word 'ASSISTANT'. The probability that they are the same letter is  
 (a)  $\frac{1}{45}$  (b)  $\frac{13}{90}$   
 (c)  $\frac{19}{90}$  (d)  $\frac{5}{8}$
22. A bag contains 6 red and 4 green balls. A fair dice is rolled and a number of balls equal to that appearing on the dice is chosen from the urn at random. The probability that all the balls selected are red is  
 (a)  $\frac{1}{3}$  (b)  $\frac{3}{10}$   
 (c)  $\frac{1}{8}$  (d) None of these
23. The value of  $\lambda$  for which the volume of parallelepiped formed by the vectors  $\mathbf{i} + \lambda\mathbf{j} + \mathbf{k}$ ,  $\mathbf{j} + \lambda\mathbf{k}$  and  $\lambda\mathbf{i} + \mathbf{k}$  is minimum is given by  
 (a) -3 (b) 3  
 (c)  $\frac{1}{\sqrt{3}}$  (d)  $-\sqrt{3}$
24. A six faced die is a biased one. It is thrice more likely to show an odd number than to show an even number. It is thrown twice. The probability that the sum of the numbers in the two throws is even, is  
 (a) 4/8 (b) 5/8  
 (c) 6/8 (d) 7/8
25. A letter is known to have come from either TATANAGAR or CALCUTTA. On the envelope, just two consecutive letters, TA, are visible. The probability that the letter has come from CALCUTTA is  
 (a) 4/11 (b) 1/3  
 (c) 5/12 (d) None of these
26. If  $\cos \alpha + \cos \beta = a$ , and  $\sin \alpha + \sin \beta = b$  and  $\theta$  is the arithmetic mean between  $\alpha$  and  $\beta$ , then  $\sin 2\theta + \cos 2\theta$  is equal to  
 (a)  $\frac{(a+b)^2}{(a^2+b^2)}$  (b)  $\frac{(a-b)^2}{(a^2+b^2)}$   
 (c)  $\frac{a^2-b^2}{a^2+b^2}$  (d) None of these
27. If  $(1 + \tan 1^\circ)(1 + \tan 2^\circ) \dots (1 + \tan 45^\circ) = 2^n$ , then the value of  $n$  is  
 (a) 21 (b) 22  
 (c) 23 (d) 24
28. The value of  $\sin 12^\circ \sin 48^\circ \sin 54^\circ$   
 (a)  $\sin 30^\circ$  (b)  $\sin^2 30^\circ$   
 (c)  $\sin^3 30^\circ$  (d)  $\cos^3 30^\circ$
29. The value of  $\lambda$  such that the four points whose position vectors are  $3\mathbf{i} - 2\mathbf{j} + \lambda\mathbf{k}$ ,  $6\mathbf{i} + 3\mathbf{j} + \mathbf{k}$ ,  $5\mathbf{i} + 7\mathbf{j} + 3\mathbf{k}$  and  $2\mathbf{i} + 2\mathbf{j} + 6\mathbf{k}$  are coplanar is  
 (a) -6 (b) 4  
 (c) 5 (d) 8
30. Let  $\mathbf{A} = 2\mathbf{i} + \mathbf{j} - 2\mathbf{k}$  and  $\mathbf{B} = \mathbf{i} + \mathbf{j}$ . If  $\mathbf{C}$  is a vector such that  $\mathbf{A} \cdot \mathbf{C} = |\mathbf{C}|$ ,  $|\mathbf{C} - \mathbf{A}| = 2\sqrt{2}$  and the angle between  $\mathbf{A} \times \mathbf{B}$  and  $\mathbf{C}$  is  $30^\circ$ , then  $|(\mathbf{A} \times \mathbf{B}) \times \mathbf{C}|$  is equal to  
 (a)  $\frac{2}{3}$  (b)  $\frac{3}{2}$   
 (c) 2 (d) 3
31. A rigid body is rotating at the rate of 3 rads about an axis AB, where A and B are the points (1, -2, 1) and (3, -4, 2). The velocity of the point P at (5, -1, -1) of the body is  
 (a)  $3\mathbf{i} + 8\mathbf{j} + 10\mathbf{k}$  (b)  $\frac{3\mathbf{i} + 8\mathbf{j} + 10\mathbf{k}}{3}$   
 (c)  $\frac{2\mathbf{i} - 2\mathbf{j} + \mathbf{k}}{3}$  (d)  $4\mathbf{i} + \mathbf{j} + 2\mathbf{k}$
32. If  $\mathbf{A} + \mathbf{B} + \mathbf{C} = \mathbf{0}$ ,  $|\mathbf{A}| = 3$ ,  $|\mathbf{B}| = 5$ ,  $|\mathbf{C}| = 7$ , then the angle between  $\mathbf{A}$  and  $\mathbf{B}$  is  
 (a)  $\frac{\pi}{6}$  (b)  $\frac{2\pi}{3}$   
 (c)  $\frac{5\pi}{3}$  (d)  $\frac{\pi}{4}$
33. If  $f(x)$  is a polynomial satisfying  $f(x) \cdot f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$  and  $f(3) = 28$ , then  $f(4)$  is given by  
 (a) 63 (b) 65  
 (c) 67 (d) 68

34. Suppose  $P_1, P_2, \dots, P_{30}$  are thirty sets each having 5 elements and  $Q_1, Q_2, \dots, Q_n$  are  $n$  sets with 3 elements each. Let  $\bigcup_{i=1}^{30} P_i = \bigcup_{j=1}^n Q_j = S$  and each element of  $S$  belongs to exactly 10 of the  $P_i$ s and exactly 9 of the  $Q_j$ s. Then  $n$  is equal to  
 (a) 15 (b) 3  
 (c) 45 (d) None of these
35. The number of functions  $f$  from the set  $A = \{0, 1, 2\}$  into the set  $B = \{0, 1, 2, 3, 4, 5, 6, 7\}$  such that  $f(i) \leq f(j)$  for  $i < j$  and  $i, j \in A$  is  
 (a)  ${}^8C_3$  (b)  ${}^8C_3 + 2({}^8C_2)$   
 (c)  ${}^{10}C_3$  (d) None of these
36. The value of  $\int_0^{\pi/2} \frac{dx}{1 + \tan^3 x}$  is  
 (a) 0 (b) 1  
 (c)  $\frac{\pi}{4}$  (d)  $\frac{\pi}{2}$
37. The integer  $n$  for which  $\lim_{x \rightarrow 0} \frac{(\cos x - 1)(\cos x - e^x)}{x^n}$  is a finite non-zero number is  
 (a) 1 (b) 2  
 (c) 3 (d) 4
38. The area of the plane bounded by the curves  $y = \sqrt{x}$ ,  $x \in [0, 1]$ ,  $y = x^2$ ,  $x \in [1, 2]$  and  $y = -x^2 + 2x + 4$ ,  $x \in [0, 2]$  is  
 (a)  $\frac{10}{7}$  sq units  
 (b)  $\frac{19}{3}$  sq units  
 (c)  $\frac{3}{5}$  sq unit  
 (d)  $\frac{4}{3}$  sq units
39. The function  $f(x) = 2 \sin x + \sin 2x$ ,  $x \in [0, 2\pi]$  has absolute maximum and minimum at  
 (a)  $\frac{\pi}{3}, \frac{5\pi}{3}$  (b)  $\frac{\pi}{3}, \pi$   
 (c)  $\frac{5\pi}{3}, \pi$  (d) None of these
40. If  $y = \sec^{-1} \left( \frac{x+1}{x-1} \right) + \sin^{-1} \left( \frac{x-1}{x+1} \right)$ ,  $x \in [0, \infty)$  and  $x \neq 1$ , then  $\frac{dy}{dx}$  is equal to  
 (a) 1 (b)  $\frac{x-1}{x+1}$   
 (c) 0 (d)  $\frac{x+1}{x-1}$

## Analytical Reasoning

41. You are given two (unmarked) containers of capacity 9 and 4 L and a huge tank of water. Need is to get a measure of exactly 6 L of water. A move is either filling a container completely or emptying a container (either fully or partially). The smallest number of moves needed to do this task is  
 (a) 8 (b) 10  
 (c) 12 (d) None of these
42. What is the next letter in the series OTTFFSSSSN?  
 (a) T (b) O  
 (c) E (d) N
43. What is the diameter of the largest circle that can be drawn on a chessboard so that its entire circumference gets covered by the black squares and no part of the circumference on any white space, given that the chessboard has black and white squares of size one inch.  
 (a) 1 inch (b)  $\sqrt{2}$  inch  
 (c)  $\sqrt{10}$  inch (d)  $2\sqrt{3}$  inch
44. A car is filled with  $4\frac{1}{2}$  L of fuel for a round trip. If amount of fuel taken while going is  $\frac{1}{4}$ th more than the amount taken for coming, what is the amount of fuel consumed when coming back?  
 (a) 1.5 (b) 2  
 (c) 1.75 (d) None of these
45. Which of the following are greater than  $x$  when  $x = \frac{9}{11}$ ?  
 I.  $\frac{1}{x}$       II.  $\frac{x+1}{x}$       III.  $\frac{x+1}{x-1}$   
 (a) I only (b) I and II only  
 (c) I and III only (d) II and III only
46. Four friends—Arjan, Bhuvan, Guran and Lakha comparing the number of sheep that they owned. It was found that Guran had ten more sheep than Lakha. If Arjan gave one-third to Bhuvan and Bhuvan gave a quarter of what he then held to Guran, who then passed on a fifth of his holding to Lakha, they would all have an equal number of sheep. How many sheep did each of them possess? Give the minimal possible answer.  
 (a) 200, 105, 110, 100  
 (b) 90, 55, 55, 45  
 (c) 180, 110, 110, 100  
 (d) None of the above
47. In a class, six students P, Q, R, S, T and U are the top six rank holders, not necessarily in the same order. R did not get the 4th rank. P's rank is higher than U's and R's but lower than Q's. Among these six rankers, there are four students whose ranks are lower than S's rank and five students whose ranks are above that of T. Who is ranked 5th in the class?  
 (a) U (b) T  
 (c) R (d) None of these

48. Three players-Aalu, Kachaalu and Bhalu were playing pocker and suddenly started to quarrel among themselves blaming each other for cheating. It was found out that atleast one person among the three cheated. When they were asked who cheated, their replies were as follows.

**Aalu** I did not cheat, Kachaalu cheated.

**Kachaalu** I did not cheat, both Aalu and Bhalu cheated.

**Bhalu** I did not cheat, only Kachaalu did not cheat.

If exactly one person among them always spoke truth, another always lied and the third alternated between the truth and lie, then which of the following statements can never be true in any case?

- (a) Only Aalu and Bhalu cheated.  
(b) Only Aalu and Bhalu did not cheat.  
(c) Bhalu always spoke the truth.  
(d) Bhalu alternated between truth and lie.
49. If  $x$  and  $y$  are the two digits of the number  $565xy$  such that this number is divisible by 80, then  $x + y$  is equal to

- (a) 2 (b) 3  
(c) 8 (d) 6

50. If both  $7^2$  and  $3^3$  are factors of the number  $(a \cdot 11^3 \cdot 6^2 \cdot 13^{11})$ , then what is the smallest possible value of  $a$ ?

- (a) 1323 (b) 147  
(c) 21 (d) 3087

51. Let  $x, y$  and  $z$  be distinct integers,  $x$  and  $y$  are odd and positive, and  $z$  is even and positive. Which one of the following statements cannot be true?

- (a)  $(x - z)^2 y$  is even (b)  $(x - z) y^2$  is odd  
(c)  $(x - z) y$  is odd (d)  $(x - y)^2 z$  is even

52. From a height of 16 m, a ball fell down and each time it bounces half the distance back. What is the distance travelled?

- (a) 45 m (b)  $\infty$   
(c) 48 m (d) 24 m

53. If a man walks at the rate of 4 km/h, he misses a train by only 6 min. However, if he walks at the rate of 5 km/h he reaches the station 6 min before the arrival of the train. Find the distance covered by him to reach the station.

- (a) 4 km (b) 7 km  
(c) 9 km (d) 5 km

**Directions** (Q. Nos. 54-57) Read the following statements and answer questions.

The office staff of XYZ corporation presently consists of three book keepers, P, Q, R and 5 secretaries S, T, U, V, W. The Management is planning to open a new office in another city using 2 book keepers and 3 secretaries of the present staff. To do so they plan to separate certain individuals who don't function well together. The following guidelines were established to set up the new office.

- (i) Book keepers P and R are constantly finding fault with one another and should not be sent together to the new office as a team.

- (ii) R and T function well alone but not as a team, they should be separated.  
(iii) S and V have not been on speaking terms and shouldn't go together.  
(iv) Since, S and U have been competing for promotion they shouldn't be a team.

54. If P is to be moved as one of the bookkeepers, which of the following cannot be a possible working unit?

- (a) PQSTW (b) PQSVW  
(c) PQTUW (d) PQTUV

55. If R and U are moved to the new office, how many combinations are possible?

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

56. If R is sent to the new office, which member of the staff cannot go with R?

- (a) Q (b) S  
(c) W (d) V

57. If S goes to the new office, which of the following is true?

- (a) Only R cannot go  
(b) Only P cannot go  
(c) Only P and R cannot go  
(d) R cannot go and W must go

58. Substitute digits for the letters to make the following relation true.

S T I L L  
+ W I T H I N  
L I M I T S

**Note** The leftmost letter can't be zero in any word. Also, there must be a one-to-one mapping between digits and letters. e.g., if you substitute 3 for the letters S, no other letter can be 3 and all other S in the puzzle must be 3.

- (a) 98533 + 258056 = 356589  
(b) 41211 + 527013 = 938224  
(c) 98533 + 158056 = 256589  
(d) 47166 + 517013 = 614179

59. 12 members were present at a board meeting. Each member shook hands with all of the other members before and after the meeting. How many hand shakes were there?

- (a) 118 (b) 127  
(c) 132 (d) 264

60. The letters P, Q, R, S, T, U and V not necessarily in that order represents seven consecutive integers from 22 to 33.

U is as much less than Q as R is greater than S.

V is greater than U.

Q is the middle term.

P is 3 greater than S.

Can you find the sequence of letters from the lowest value to the highest value?

- (a) PVSQRTU (b) SUTQPRV  
(c) USVQPRT (d) TUSQRPV

61. There were a total of 10 bicycles and tricycles. If the total number of wheels was 24, how many tricycles were there?

- (a) 4 (b) 6  
(c) 8 (d) 2

62. A person travels on a cycle from home to church on a straight road with wind against him. He took 4 h to reach there. On the way back to the home, he took 3 h to reach as wind was in the same direction. If there is no wind, how much time does he take to travel from home to church?  
(a) 3 h 35 min 12 s  
(b) 3 h 32 min 32 s  
(c) 3 h 30 min 00 s  
(d) 3 h 25 min 42 s
63. What are the next three numbers in the given series.  
1 1 2 1 2 2 3 1 2 2 3 2 3 3 4 1 2 2 3 2 3 3 4 2 3 3?  
(a) 2, 3, 4  
(b) 2, 3, 2  
(c) 1, 2, 3  
(d) 4, 3, 4
64. In the middle of the confounded desert, there is the lost city of "Ash". To reach it, I will have to travel overland by foot from the coast. On a trek like this, each person can only carry enough rations for five days and the farthest we can travel in one day is 30 miles. Also, the city is 120 miles from the starting point. What I am trying to figure out is the fewest number of persons, including myself, that I will need in our group so that I can reach the city, stay overnight, and then return to the coast without running out of supplies. How many persons (including myself) will I need to accomplish this mission?  
(a) 5  
(b) 6  
(c) 4  
(d) 3
65. A woman took a certain number of eggs to the market and sold some of them. The next day through her poultry industry, the number left over had been doubled, and she sold the same number as the previous day. On the third day, the new remainder was tripled, and she sold the same number as before. On the fourth day, the remainder was quadrupled, and her sale were the same as before. On the fifth day, what had been left over were quintupled, yet she sold exactly the same as on all the previous occasions and so disposed of her entire stock. What is the smallest number of eggs she could have taken to the market the first day, and how many did she sell daily?  
(a) 110.50  
(b) 127.65  
(c) 100.60  
(d) 103.60
66. The Bulls, Pacers, Lakers and Jazz ran for a contest. Anup, Sujit, John made the following statements regarding results.  
• Anup said either Bulls or Jazz will definitely win.  
• Sujit said he is confident that Bulls will not win.  
• John said he is confident that neither Jazz nor Lakers will win.  
When the result came, it was found that only one of the above three had made a correct statement. Who has made the correct statement and who has won the contest?  
(a) Anup, Bulls  
(b) John, Pacers  
(c) Sujit, Lakers  
(d) Sujit, Jazz
67. A certain street has 1000 buildings. A sign-maker is contracted to number the houses from 1 to 1000. How many zeroes will be needed?  
(a) 128  
(b) 190  
(c) 181  
(d) 192
68. Examine the following sequence of numbers.  
1  
1 1  
2 1  
1 2 1 1  
1 1 1 2 2 1  
3 1 2 2 1 1  
1 3 1 1 2 2 2 1  
1 1 1 3 2 1 3 2 1 1  
3 1 1 3 1 2 1 1 1 3 1 2 2 1  
What are the next two numbers in the given series?  
(a) 13211311122111231131 and 11213211321222111131221133  
(b) 23113112211132113111 and 11121321132122211131221133  
(c) 11231131122111321131 and 11131221212221133112132113  
(d) 13211311123113112211 and 11131221133112132113212221
69. There were two men standing on a street. The one says to the other. "I have 3 daughters, the product of their ages is 36. What is the age of the OLDEST daughter?" The second guy says, "I need more informaton." So, the first guy says, "The sum of their ages is equal to the address of the house across the street." The second guy looks at the address and says, "I still need more information". So, the first guy says. "My oldest daughter wears a red dress."  
(a) 9  
(b) 6  
(c) 12  
(d) 4
70. Three Gold (G) coins, three Silver (S) coins and three Copper (C) coins are arranged in a single row as follows  
• Only 2 adjacent unlike coins can be moved at any one time.  
• The moved coins must be in contact with atleast one other coin in line i.e., no pair of coins is to be moved and placed away from the remaining ones.  
• No coin pairs can be reversed i.e., S-C combination must remain in that order in its new position when it is moved.  
What is the minimum number of moves required to get all the coins in following order?  
C C C S S S G G G  
(a) 6  
(b) 9  
(c) 8  
(d) 12
71. Mr. and Mrs. Birla and Mr. and Mrs. Tata competed in a Chess tournament. Of the three games played  
I. In only the first game were the two players married to each other.  
II. The men won two games and the women won one game.  
III. The Birlas won more games than the Tatas.  
IV. Anyone who lost a game did not play a subsequent game.  
Who did not lose a game?  
(a) Mr Birla  
(b) Mrs Birla  
(c) Mr Tata  
(d) Mrs Tata

72. Of the three numbers, second is twice the first and is also thrice the third. If the average of three numbers is 44, the largest number is  
(a) 24 (b) 36  
(c) 72 (d) 108
73. Larger, medium and small ships are used to bring water. 4 large ships carry as much water as 7 small ships. 3 medium ships carry the same amount of water as 2 large ships and 1 small ship. 15 large, 7 medium and 14 small ships, each made 36 journeys and brought a certain quantity of water. In how many journeys would 12 large, 14 medium and 21 small ships bring the same quantity of water?  
(a) 32 (b) 25 (c) 29 (d) 49
74. Five men P, Q, R, S and T read newspaper. The one who reads first gives it to R. The one who reads last had taken it from P. T was not the first or the last to read. There were two readers between Q and P. To whom did Q pass the newspaper?  
(a) R (b) P  
(c) S (d) T
75. An airline has a certain free luggage allowance and charges for excess luggage at a fixed rate per kg. Two passengers Raja and Rahim have 60 kg of luggage between them, and are charged ₹ 1200 and ₹ 2400, respectively for excess luggage. Had the entire luggage belonged to one of them, the excess luggage charge would have been ₹ 5400. What is the weight of Rahim's luggage?  
(a) 20 kg (b) 25 kg  
(c) 30 kg (d) 35 kg
76. A group of 630 children is arranged in rows for a group photograph session. Each row contain three fewer children than the row in front of it. What numbers of rows is not possible?  
(a) 3 (b) 4  
(c) 5 (d) 6

**Directions (Q. Nos. 77-80) Read the following passage and answer the questions.**

Sports (and game) persons P, Q, R, S, T, U and V of a university are at the Bengaluru Airport. Five of them are selected players and leaving to participate in the Grand Sports Event in five different events cricket, carrom, badminton and table tennis being held at 5 different cities Mumbai, Chennai, Kolkata, Delhi and Hyderabad.

- (i) P is going to Delhi, but he does not play either cricket or carrom.  
(ii) Q has come to give send off to R, who is a chess player and is not leaving to either Mumbai or Hyderabad.  
(iii) S is leaving to Kolkata to play table tennis.  
(iv) U is leaving to Mumbai but he does not play either badminton or cricket.  
(v) T is not a selected player.

77. Who plays badminton?  
(a) P (b) Q (c) R (d) S
78. Cricketer goes to  
(a) Mumbai (b) Hyderabad  
(c) Chennai (d) Delhi

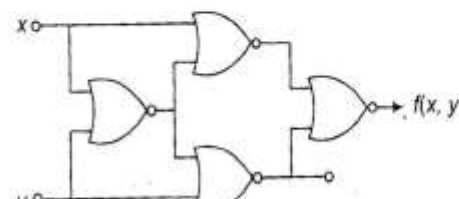
79. Player of which game goes to Delhi?  
(a) Badminton (b) Chess  
(c) Cricket (d) Table Tennis
80. Who plays chess and where is he going?  
(a) R and Chennai (b) S and Mumbai  
(c) U and Delhi (d) None of these

**Directions (Q. Nos. 81-85) Read the following information carefully and answer the questions.**

- (i)  $P \psi Q$  means P is mother of Q  
(ii)  $P \in Q$  means P is sister of Q  
(iii)  $P \$ Q$  means P is father of Q  
(iv)  $P \# Q$  means P is brother of Q

81. Which of the following means N is definitely daughter of K?  
(a)  $K \$ L \# M \# N$  (b)  $M \psi K \$ N \in L$   
(c)  $K \psi M \# L \in N$  (d)  $L \psi K \$ N \# M$
82. Which of the following means R is brother of T?  
(a)  $R \psi S \# U \$ T$  (b)  $U \psi R \# S \# T$   
(c)  $U \psi R \in S \psi T$  (d)  $T \# \$ S Q \in R$
83. Which of the following means X is real grandmother of Y?  
(a)  $X \in Z \psi K \$ L \# Y$  (b)  $Y \psi K \$ X \# L$   
(c)  $Y \# L \$ K \psi X \in Z$  (d)  $K \# X \psi Z \# L \$ Y$
84. If  $K \psi L \in M \# N$ , then how K is related with N?  
(a) Mother (b) Aunt  
(c) Great Aunt (d) Grandmother
85. Which of the following means K is nephew of M?  
(a)  $N \# M \$ L \# K \in O$  (b)  $K \# L \$ N \in O \$ M$   
(c)  $L \psi O \# M \$ O \in K$  (d)  $M \# N \$ L \# K \$ O$
86. There are six houses in a row. Mr. Lal has Mr. Babu and Mr. Anil as neighbours. Mr. Bhatia has Mr. Gupta and Mr. Sharma as neighbours. Mr. Gupta's house is no next to Mr. Babu or Mr. Anil and Mr. Sharma does not live next to Mr. Anil. Who are Mr. Babu's next-door neighbours?  
(a) Mr. Lal and Mr. Bhatia (b) Mr. Lal and Mr. Anil  
(c) Mr. Sharma and Mr. Lal (d) Only Mr. Lal
87. A watch which gains 10 s in 5 min was set correct at 9 am. When the watch indicated 20 min past 7 O' clock, the same evening, the true time is  
(a) 7 pm (b) 7:40 pm  
(c) 7:10 pm (d) 8 pm
88. A boy observes the reflection of a clock in a mirror. The time observed by the boy in the mirror is 3 h 45 min. What is the actual time shown in the clock?  
(a) 8 h 45 min (b) 9 h 45 min  
(c) 8 h 15 min (d) 9 h 15 min
89. Gold is 19 times as heavy as water and copper is 9 times as heavy as water. In what ratio should these be mixed to get an alloy 15 times as heavy as water?  
(a) 1 : 2 (b) 2 : 3  
(c) 3 : 2 (d) 1 : 1
90. In an objective type examination, 120 objective type questions are there : each with 4 options P, Q, R and S. A candidate can choose either one of these options or can leave the question unanswered. How many different ways exist for answering this question paper?  
(a)  $5^{120}$  (b)  $4^{120}$   
(c)  $120^5$  (d)  $120^4$

# Computer Awareness

91. A CPU has an arithmetic unit that adds bytes and then sets its V,C and Z flag bits as follows : The V-bit is set if arithmetic overflow occurs. The C-bit is set if a carry-out is generated from the most significant bit during an operation. The Z-bit is set if the result is zero. What are the values of the V, C and Z flag bits respectively after the 8-bit bytes 1100 1100 and 1000 1111 are added?  
 (a) 0, 0, 0 (b) 1, 1, 0  
 (c) 1, 1, 1 (d) 0, 1, 0
92. Which one of the following statements is always true?  
 (a) A compiled program uses more memory than an interpreted program.  
 (b) A compiler converts a program to a lower level language for execution.  
 (c) A compiler for a high level language takes less memory than its interpreter.  
 (d) Compiled programs take more time to execute than interpreted programs.
93. Floating point numbers in a computer are represented using a 10-bit mantissa (including a sign bit) and a 7-bit exponent (including a sign bit). What is the approximate value of the maximum number, which can be represented? Assume that the mantissa is stored in the normalised form, that is, without leading zeroes.  
 (a)  $2^{123}$  (b)  $2^{127}$   
 (c)  $2^{64}$  (d)  $2^{63}$
94. The capacity of a memory unit is defined by the number of words multiplied by the number of bits per word. How many separate address and data line are needed for a memory of  $4K \times 16$ ?  
 (a) 10 address lines and 16 data lines  
 (b) 12 address lines and 10 data lines  
 (c) 12 address lines and 16 data lines  
 (d) 12 address lines and 8 data lines
95. The main disadvantage of direct mapping of cache organization is that  
 (a) it doesn't allow simultaneous access to the intended data and its tag.  
 (b) it is more expensive than other type of organizations.  
 (c) the cache hit ratio is degraded if two or more blocks used alternatively map onto the same block frame in the cache.  
 (d) the number of blocks required for the cache increases linearly with the size of the main memory.
96. Let  $A[1..10]$  be an array, let  $A[i]=2i$  for  $1 \leq i \leq 10$ . After the assignment  $j = A[A[5]]$  is executed, the value of  $A[j]$  is equal to  
 (a) Undefined (b) 1  
 (c) 8 (d) 10
97. The first instruction of bootstrap loader program of an operating system is stored in  
 (a) RAM (b) BIOS  
 (c) Hard disk (d) None of these
98. The function  $AB'C + A'BC + ABC' + A'B'C$  is equivalent to  
 (a)  $AC' + AB + A'C$   
 (b)  $AB' + AC' + A'C$   
 (c)  $A'B + AC' + AB'$   
 (d)  $A'B + AC + AB'$
99. The addition of 4 bit, 2's complement binary numbers 1101 and 0100 results in  
 (a) 0001 and an overflow  
 (b) 1001 and no overflow  
 (c) 0001 and no overflow  
 (d) 1001 and an overflow
100. Given  $\sqrt{(224)}_r = (13)$ , the value of radix  $r$  is  
 (a) 10 (b) 8  
 (c) 6 (d) 5
101. Let  $A = 11111010$  and  $B = 00001010$  be two 8 bit 2's complement numbers. Their product in 2's complement is  
 (a) 11000100 (b) 10011100  
 (c) 10100101 (d) 11010101
102. Identify the logic function performed by the circuit.  
  
 (a) Exclusive OR (b) Exclusive NOR  
 (c) NAND (d) NOR
103. Which of the following is (are) true about virtual memory systems that uses pages?  
 I. The virtual address space can be larger than the amount of physical memory.  
 II. Programs must be resident in main memory throughout their execution.  
 III. Pages correspond to semantic characteristics of the programs.  
 (a) I only (b) II only  
 (c) I and II (d) I and III
104. The minimum number of gates needed to implement the Boolean function  $f(x, y, z) = z(x + y) + (\bar{z} + x + y)(\bar{x} + \bar{y})$  is  
 (a) 2 (b) 3  
 (c) 4 (d) 5
105. How many bits are required to store an ASCII character?  
 (a) 7 (b) 6  
 (c) 8 (d) None of these

## General English

**Directions** (Q. Nos. 106-107) *Read the following information carefully and answer the questions.*

Each sentence given in the questions has two blanks, each blank indicating that something has been omitted. Beneath the sentence are four sets of words. Choose the set of words for each blank that best fits the meaning of the sentence as a whole.

106. Greek philosophers tried to ..... contemporary notions of change and stability by postulating the existence of the atom, ..... particle from which all varieties of matter are formed.
- (a) confirm... an interesting  
(b) reconcile... an indivisible  
(c) simplify... a specific  
(d) eliminate... an infinitesimal

107. The Tata group will need all its considerable management ..... and ..... to manage tough challenges ahead after taking over Corus Steel.
- (a) skills...interests  
(b) knowledge...manpower  
(c) acumen...onus  
(d) experience...brand equity

**Directions** (Q. Nos. 108-109) *Read the following information carefully and answer the questions.*

In each of the following questions, a related pair of words or phrases is followed by four pairs of words or phrases. Select the pair that best expresses a relationship similar to that expressed in the original pair.

108. INFLAMMABLE : IGNITED :: ..... : .....
- (a) Fragile : Shattered  
(b) Flexible : Broken  
(c) Famous : Plagiarized  
(d) Somber : Mourned
109. SAVANT : OBTUSE :: ..... : .....
- (a) Seer : Ominous (b) Writer : Verbose  
(c) Judge : Melodramatic (d) Athlete : Sluggish

**Directions** (Q. Nos. 110-111) *Each question consists of a word printed in capital letters, followed by four words or phrases. Choose the word or phrase that is most nearly opposite in meaning to the word in capital letters.*

110. **OPPROBRIUM**
- (a) Honour (b) Prudence  
(c) Ostentation (d) Umbrage
111. **INCESSANT**
- (a) Perpetual (b) Persistent  
(c) Sporadic (d) Unrelenting

**Directions** (Q. Nos. 112-113) *Each question consists of a word printed in capital letters, followed by four words or phrases. Choose the word or phrase that is most similar in meaning to the word in capital letters.*

112. **EXASPERATE**
- (a) Pacify (b) Mollify  
(c) Irritate (d) Placate

**Directions** (Q. Nos. 117-118) *In each of the following questions, a sentence is given with a blank followed by four alternatives. Choose the word or phrase that most correctly completes the sentences.*

117. Mary did not attend office yesterday. She ..... for a picnic.
- (a) will have gone (b) have gone  
(c) may have gone (d) would go
118. I don't know where Maya is. She ..... at home.
- (a) would be (b) is  
(c) can be (d) could be

### 113. INIMICAL

- (a) Antagonistic (b) Anonymous  
(c) Fanciful (d) Accurate

**Directions** (Q. Nos. 114-116) *Read the following passage and answer the questions, based on what is stated or implied in the passage.*

Declassification of government documents has shed new light on the events comprising the Cuban missile Crisis of October 1962. Prior to the accessibility of these records, the only source of account of the Crisis for scholars and historians were the personal memoirs and narratives of the officials who served under Kennedy and Krushchev during this period. Many of the declassified documents are transcriptions and notes of meetings between members of the CIA and President Kennedy's Cabinet, as well as the President himself. The revelations in these documents have demonstrated the inadvertent inaccuracies and intended obscurities inherent in the first-person narratives of the Crisis, and has aided historians from all three countries involved in the Crisis to get a more authentic representation of what truly transpired, and for what reasons. Of perhaps the most interest to historians are declassified correspondence between John F. Kennedy and Nikita Krushchev that challenge the idea that the height of the Crisis extended only over the course of thirteen days. Indeed, these letters indicate that the Crisis was far from resolved by Krushchev's October 28 decision to withdraw the Soviet missiles from Cuba : instead it endured far into the following month, while America slept fitfully under the illusion of peace.

114. The author is mainly concerned with
- (a) Petitioning the government to make all classified documents of historic interest accessible to the general public.  
(b) Discounting the sense of danger many Americans felt during the Cuban Missile Crisis.  
(c) Revealing a calculated deception perpetrated by members of Kennedy's Cabinet.  
(d) Illustrating how previously accepted ideas based on hearsay are being refuted by concrete evidence.
115. According to the passage, which of the following statement(s) is/are true for the Cuban Missile Crisis?
- I. The Crisis is still shrouded in mystery.  
II. The memories of those closely involved in the Crisis were not entirely factual.  
III. The crisis spanned thirteen tense days.
- (a) I only (b) II only  
(c) III only (d) II and III
116. The author's use of the phrase "inadvertent inaccuracy and intended obscurities" suggests all of the following EXCEPT
- (a) historical record is often skewed by human perception  
(b) details of the crisis were purposely omitted or vague  
(c) every politician deals in deception and prevarication  
(d) memory is incapable of recapturing the full details of an event
117. Choose the most appropriate meaning for the following idiom 'To fish in troubled waters'
- (a) To make the situation worse  
(b) To make profit when others in trouble  
(c) To create trouble for others  
(d) To indulge in evil acts
118. Read the following sentence and choose one underlined word or phrase that would not be appropriate in standard English. One of the chair's legs was broken and the upholstery need mending
- (a) the (b) chair's  
(c) legs (d) needed