

1. The tangent at the point (2, -2) to the curve $x^2y^2 - 2x = 4(1 - y)$ does not pass through the point _____
(a) (-2, -7) (b) (-4, -9) (c) $(4, \frac{1}{3})$ (d) (8, 5)
2. The integral $\int \sqrt{1 + 2\cot x (\operatorname{cosec} x + \cot x)} dx; \left(0 < x < \frac{\pi}{2}\right)$ (where C is a constant of integration) is equal to
(a) $2\log\left(\sin\frac{x}{2}\right) + C$ (b) $2\log\left(\cos\frac{x}{2}\right) + C$
(c) $4\log\left(\cos\frac{x}{2}\right) + C$ (d) $4\log\left(\sin\frac{x}{2}\right) + C$
3. If all the words, with or without meaning, are written using the letters of the word **QUEEN** and are arranged as in English Dictionary, then the position of the word **QUEEN** is
(a) 47th (b) 44th (c) 45th (d) 46th
4. The curve satisfying the differential equation, $ydx - (x + 3y^2)dy = 0$ and passing through the point (1, 1) also passes through the point _____
(a) $\left(\frac{1}{4}, \frac{1}{2}\right)$ (b) $\left(\frac{1}{4}, -\frac{1}{2}\right)$
(c) $\left(-\frac{1}{3}, \frac{1}{3}\right)$ (d) $\left(\frac{1}{3}, -\frac{1}{3}\right)$
5. $\lim_{x \rightarrow 3} \frac{\sqrt{3x} - 3}{\sqrt{2x} - 4 - \sqrt{2}}$ is equal to
(a) $\sqrt{3}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2\sqrt{2}}$ (d) $\frac{1}{\sqrt{2}}$
6. The mean of 5 observations is 5 and their variance is 124. If three of the observations are 1, 2, 6, then the mean deviation from the mean of the data is
(a) 2.5 (b) 2.6 (c) 2.8 (d) 2.4
7. In a beauty contest, half the number of experts voted Mr. A and two thirds voted for Mr. B. 10 voted for both and 6 did not for either. How many experts were there in all?
(a) 18 (b) 36 (c) 24 (d) None
8. The value of non-zero scalars r and s such that for all vectors \vec{a} and \vec{b} such that $r(\vec{a} + 2\vec{b} - s\vec{a})(4\vec{b} - \vec{a}) = 0$ is
(a) $r = 2, s = 1$ (b) $r = -2, s = -3$
(c) $r = 1, s = 3$ (d) $r = -2, s = 3$
9. A force of 78 grams acts at the point (2, 3, 5). The direction ratios of the line of action being 2, 2, 1. The magnitude of its moment about the line joining the origin to the point (12, 3, 4) is
(a) 24 (b) 136 (c) 36 (d) 0
10. Number of real solutions of the equation $\sin(e^x) = 5^x + 5^{-x}$ is
(a) 0 (b) 1 (c) 2 (d) Infinitely many
11. For two circles $x^2 + y^2 = 16$ and $x^2 + y^2 - 2y = 0$, there is/are
(a) One pair of common tangents
(b) Two pairs of common tangents
(c) Three common tangents
(d) No common tangents
12. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \begin{cases} x \sin\left(\frac{1}{x}\right) & \text{if } x > 0 \\ 0 & \text{if } x \leq 0 \end{cases}$
Then
(a) f is neither continuous nor differentiable at $x=0$.
(b) f is continuous and differentiable at $x=0$.
(c) f is continuous but not differentiable at $x=0$.
(d) f is not continuous but differentiable at $x=0$.
13. A particle P starts from the point $z_0 = 1 + 2i$, where $i = \sqrt{-1}$. It moves first horizontally away from the origin by 5 units and then vertically away from the origin by 3 units to reach a point z_1 . From z_1 the particle moves $\sqrt{2}$ units in the direction of the vector $\hat{i} + \hat{j}$ and, then it moves through an angle $\frac{\pi}{2}$ in an anti-clockwise direction on a circle with centre at the origin, to reach a point z_2 . The point z_2 is given by
(a) $6 + 7i$ (b) $-7 + 6i$
(c) $7 + 6i$ (d) $-6 + 7i$
14. If $\Delta = a^2 - (b - c)^2$, where Δ is the area of the $\triangle ABC$, then $\tan A$ equals
(a) $\frac{15}{16}$ (b) $\frac{8}{15}$ (c) $\frac{8}{17}$ (d) $\frac{1}{2}$
15. Two numbers a and b are chosen at random from a set of first 30 natural numbers, then the probability that $a^2 - b^2$ is divisible by 3 is
(a) $\frac{47}{87}$ (b) $\frac{15}{87}$ (c) $\frac{12}{87}$ (d) $\frac{9}{87}$

16. If $\sin^2 x \tan x + \cos^2 x \cot x - 2 \sin 2x = 1 + \tan x + \cot x$,

$x \in (0, f)$, then $x =$

(a) $\frac{3f}{12}, \frac{5f}{12}$ (b) $\frac{5f}{12}, \frac{7f}{12}$

(c) $\frac{7f}{12}, \frac{11f}{12}$ (d) $\frac{7f}{12}, \frac{9f}{12}$

17. \vec{a} and \vec{b} are non-zero non-collinear vectors such that

$|\vec{a}| = 2$, $\vec{a} \cdot \vec{b} = 1$ and the angle between \vec{a} and \vec{b} is $\frac{f}{3}$.

If \vec{r} is any vector satisfying $\vec{r} \cdot \vec{a} = 2\vec{r} \cdot \vec{b} = 8$,

$(\vec{r} + 2\vec{a} - 10\vec{b}) \cdot (\vec{a} \times \vec{b}) = 6$ and $\vec{r} + 2\vec{a} - 10\vec{b} = \lambda(\vec{a} \times \vec{b})$, then $\lambda =$

(a) $\frac{1}{2}$ (b) 2 (c) $\frac{4}{\sqrt{3}}$ (d) 3

18. In a chess tournament, n men and 2 women players participated. Each player plays 2 games against every other player. Also, the total number of games played by the men among themselves exceeded by 66 the number of games that the men played against the women. Then the total number of players in the tournament is

(a) 13 (b) 11 (c) 9 (d) 7

19. Suppose A_1, A_2, \dots, A_{30} are thirty sets each having 5 elements with no common element across the sets and B_1, B_2, \dots, B_n are n sets each having 3 elements with no common element across the sets. Let

$\bigcup_{i=1}^{30} A_i = \bigcup_{j=1}^n B_j = S$, and each element of S belongs to

exactly 10 of A_i 's and exactly 9 of B_j 's. The value of n is equal to

(a) 15 (b) 30
(c) 40 (d) 45

20. Let $f(x) = \begin{cases} \cos[x], & x \geq 0; \\ |x| + a, & x < 0 \end{cases}$, where $[x]$ denotes the

greatest integer $\leq x$. If f should be continuous at $x = 0$, then a must be

(a) 0 (b) 1 (c) 2 (d) -1

21. If S and S' are foci of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, B is the end of the minor axis and BSS' is an equilateral triangle, then the eccentricity of the ellipse is

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

22. The equation of the circle passing through the point (4, 6) and whose diameters are along $x + 2y - 5 = 0$ and $3x - y - 1 = 0$ is

(a) $x^2 + y^2 - 2x - 6y - 20 = 0$

(b) $x^2 + y^2 - 6x - 2y - 20 = 0$

(c) $x^2 + y^2 - 2x - 4y - 20 = 0$

(d) $x^2 + y^2 - 4x - 2y - 20 = 0$

23. In a parallelogram ABCD, P is the midpoint AD. Also, BP and AC intersect at Q. Then AQ : QC =

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

24. The median AD of $\triangle ABC$ is bisected at E and BE is extended to meet the side AC in F. Then AF : FC =

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

25. Let $p(x)$ be a quadratic polynomial such that $p(0) = 1$. If $p(x)$ leaves remainder 4 when divided by $x - 1$ and it leaves remainder 6 when divided by $x + 1$, then

(a) $p(-2) = 11$ (b) $p(2) = 11$

(c) $p(2) = 19$ (d) $p(-2) = 19$

26. Solution set of the inequality

$\log_3(x+2)(x+4) + \log_3(x+2) < \frac{1}{2} \log_3 7$ is

(a) $(-2, -1)$ (b) $(-2, 3)$ (c) $(-1, 3)$ (d) $(3, \infty)$

27. If a, b, c are in GP and $\log a - \log 2b, \log 2b - \log 3c$ and $\log 3c - \log a$ are in AP, then a, b, c are the lengths of the sides of a triangle which is

(a) Acute angled (b) Obtuse angled
(c) Right angled (d) Equilateral

28. If $x, 2x + 2, 3x + 3$ are the first three terms of a geometric progression, then 4th term in the geometric progression is

(a) -13.5 (b) 13.5
(c) -27 (d) 27

29. If $(1 + x - 2x^2)^6 = 1 + a_1x + a_2x^2 + \dots + a_{12}x^{12}$, then the value of $a_2 + a_4 + a_6 + \dots + a_{12}$ is

(a) 29 (b) 30 (c) 31 (d) 32

30. If a and b are the greatest values of ${}^{2n}C_r$ and ${}^{(2n-1)}C_r$ respectively, then

(a) $a = 2b$ (b) $b = 2a$

(c) $a = b$ (d) $a^2 = 2b^2$

31. The sum of infinite terms of a decreasing GP is equal to the greatest value of the function $f(x) = x^3 + 3x - 9$ in the interval $[-2, 3]$ and the difference between the first two terms is $f'(0)$. Then the common ratio of the GP is
- (a) $-\frac{2}{3}$ (b) $\frac{4}{3}$ (c) $\frac{2}{3}$ (d) $-\frac{4}{3}$
32. Number of onto (surjective) functions from A to B if $n(A) = 6$ and $n(B) = 3$ is
- (a) $2^6 - 2$ (b) $3^6 - 3$
(c) 340 (d) 540
33. If $|z| < \sqrt{3} - 1$, then $|z^2 + 2z \cos r|$ is
- (a) less than 2 (b) $\sqrt{3} + 1$
(c) $\sqrt{3} - 1$ (d) None of these
34. A computer producing factory has only two plants T_1 and T_2 . Plant T_1 produces 20% and plant T_2 produces 80% of the total computers produced. 7% of the computers produced in the factory turn out to be defective. It is known that $P(\text{computer turns out to be defective given that it is produced in plant } T_1) = 10 P(\text{computer turns out to be defective given that it is produced in plant } T_2)$. A computer produced in the factory is randomly selected and it does not turn out to be defective. Then the probability that it is produced in plant T_2 is
- (a) $\frac{36}{73}$ (b) $\frac{47}{79}$ (c) $\frac{78}{93}$ (d) $\frac{75}{83}$
35. If $A > 0$, $B > 0$ and $A + B > \frac{\pi}{6}$, then the minimum value of $\tan A + \tan B$ is
- (a) $\sqrt{3} - \sqrt{2}$ (b) $4 - 2\sqrt{3}$
(c) $\frac{2}{\sqrt{3}}$ (d) $2 - \sqrt{3}$
36. A man takes a step forward with probability 0.4 and backwards with probability 0.6. The probability that at the end of eleven steps, he is one step away from the starting point is
- (a) $462(0.34)^5$ (b) $462(0.04)^5$
(c) $462(0.14)^5$ (d) $462(0.24)^5$
37. Let x_i , $i = 1, 2, \dots, n$ be n observations and $w_i = px_i + k$, $i = 1, 2, \dots, n$ where p and k are constants. If the mean of x_i 's is 48 and standard deviation is 12, whereas the mean of w_i 's is 55 and standard deviation is 15, then the values of p and k should be
- (a) $p = 1.25$, $k = -5$ (b) $p = -1.25$, $k = 5$
(c) $p = 2.5$, $k = -5$ (d) $p = 25$, $k = 5$
38. If x, y, z are distinct real numbers and $\begin{vmatrix} x & x^2 & 2+x^3 \\ y & y^2 & 2+y^3 \\ z & z^2 & 2+z^3 \end{vmatrix} = 0$, then $xyz =$
- (a) 1 (b) -1 (c) 2 (d) -2
39. Let $f(x)$ be a polynomial satisfying $f(0) = 2$, $f'(0) = 3$ and $f''(x) = f(x)$. Then $f(4)$ is equal to
- (a) $\frac{5(e^8 - 1)}{2e^4}$ (b) $\frac{5e^8 - 1}{2e^4}$
(c) $\frac{2e^4}{5e^8 - 1}$ (d) $\frac{2e^4}{5(e^8 + 1)}$
40. If $a, a_1, a_2, a_3, \dots, a_{2n-1}$, b are in AP, $a, b_1, b_2, \dots, b_{2n-1}, b$ are in GP and $a, c_1, c_2, c_3, \dots, c_{2n-1}, b$ are in HP, where a, b are positive, then the equation $a_n x^2 - b_n x + c_n = 0$ has its roots
- (a) Real and equal
(b) Real and unequal
(c) Imaginary
(d) One real and one imaginary
41. Let U and V be two events of a sample space S and $P(A)$ denote the probability of an event A . Which of the following statements is true?
- (a) If $P(U) = P(V)$ then $U = V$
(b) If $P(U) = 0$ then $U^c = S$.
(c) If $U \cap V = \emptyset$ then U and V are independent.
(d) If U and V are independent, then so are U^c and V^c .
42. If a man purchases a raffle ticket, he can win a first prize of Rs. 5000 or a second prize of Rs. 2000 with probabilities 0.001 and 0.003 respectively. What should be a fair price to pay for the ticket?
- (a) Rs. 11 (b) Rs. 15
(c) Rs. 2000 (d) None of these

43. If the mean deviation of the numbers $1, 1 + d, 1 + 2d, \dots, 1 + 100d$ from their mean is 255, then d is equal to
(a) 10.1 (b) 10.2 (c) 10.3 (d) 10.4

44. If $\sum_{i=1}^n x_i = 80$ and $\sum_{i=1}^n x_i^2 = 400$, then a possible value of n among the following is
(a) 9 (b) 12 (c) 15 (d) 18

45. Let S be the set $\{a \in \mathbb{Z}^+ : a \leq 100\}$. If the equation $[\tan^2 x] - \tan x - a = 0$ has real roots (where $[\cdot]$ is the greatest integer function), then the number of elements in S is
(a) 10 (b) 8 (c) 9 (d) 0

46. If x is real, then the minimum value of $\frac{x^2 - x + 1}{x^2 + x + 1}$ is
(a) $\frac{1}{2}$ (b) 2 (c) 3 (d) $\frac{1}{3}$

47. If $\int \cos x \cos 2x \cos 5x \, dx = A_1 \sin 2x + A_2 \sin 4x + A_3 \sin 6x + A_4 \sin 8x + c$, then the value of A_1, A_2, A_3, A_4 are
(a) $A_1 = \frac{1}{2}, A_2 = \frac{1}{4}, A_3 = \frac{1}{6}, A_4 = \frac{1}{8}$
(b) $A_1 = \frac{1}{8}, A_2 = \frac{1}{16}, A_3 = \frac{1}{24}, A_4 = \frac{1}{32}$
(c) $A_1 = \frac{1}{6}, A_2 = \frac{1}{12}, A_3 = \frac{1}{18}, A_4 = \frac{1}{24}$
(d) $A_1 = \frac{1}{4}, A_2 = \frac{1}{8}, A_3 = \frac{1}{12}, A_4 = \frac{1}{16}$

48. If $\int_{\log 2}^x \frac{1}{\sqrt{e^t - 1}} \, dt = \frac{f}{6}$, then $x =$
(a) $\log 2$ (b) $2 \log 2$
(c) $3 \log 2$ (d) $4 \log 2$

49. Equation of the tangent from the point $(3, -1)$ to the ellipse $2x^2 + 9y^2 = 3$ is
(a) $2x - 3y - 3 = 0$ (b) $2x + 3y - 3 = 0$
(c) $2x + y - 3 = 0$ (d) None of these

50. The position vectors of the vertices A, B, C of a tetrahedron $ABCD$ are $\hat{i} + \hat{j} + \hat{k}, \hat{i}$ and $3\hat{i}$ respectively and the altitude for the vertex D to the opposite face ABC meets the face at E . If the length of the edge ED is 4 and the volume of the tetrahedron is $\frac{2\sqrt{2}}{3}$, then the length of DE is
(a) 1 (b) 2 (c) 3 (d) 4

ANALYTICAL ABILITY & LOGICAL REASONING

51. 1. All chickens are birds.
2. Some chickens are hens.
3. Female birds lay eggs.
If the above three statements are facts, which of the following statements must also be a fact?
I. All birds lay eggs.
II. Hens are birds.
III. Some chickens are not hens.
(a) II only
(b) II and III only
(c) I, II and III
(d) None of the statements is a known fact.
52. The number that comes next in the series 1, 2, 3, 6, 11, 20, 37, 68, ... is
(a) 105 (b) 124 (c) 125 (d) 126
53. Using only 2, 5, 10, 25 and 50 paise coins, the smallest number of coins required to pay exactly 79 paise, 66 paise, and Re. 1.01 to three different persons is
(a) 17 (b) 20 (c) 19 (d) 18
54. What pair comes next in the following sequence; 99, 90, 83, 78, ...
(a) 71, 69 (b) 69, 57 (c) 67, 59 (d) 69, 63
55. A dealer offers a cash discount of 20% and still makes a profit of 20% when he further allows 16 articles to a dozen to a particularly sticky bargainer. How much above the actual price was the listed price of the article?
(a) 100% (b) 80% (c) 75% (d) 66%
56. A clock is set right at 5 AM. The clock loses 16 m in 24 th. What will be the night time when the clock indicates 10 pm on the 4th day?
(a) 11.15 PM (b) 11. 00 PM
(c) 12.00 PM (d) 12.30 PM
57. A train overtakes two persons who are walking in the same direction in which the train is moving at the rate of 2kmph and 4kmph and passes them completely in 9 and 10 seconds respectively. Then length of the train is
(a) 72 m (b) 54 m
(c) 50 m (d) 45 m

58. Decide which of the given conclusion logically following from the given statement(s) :

Statements :

All suns are moons.

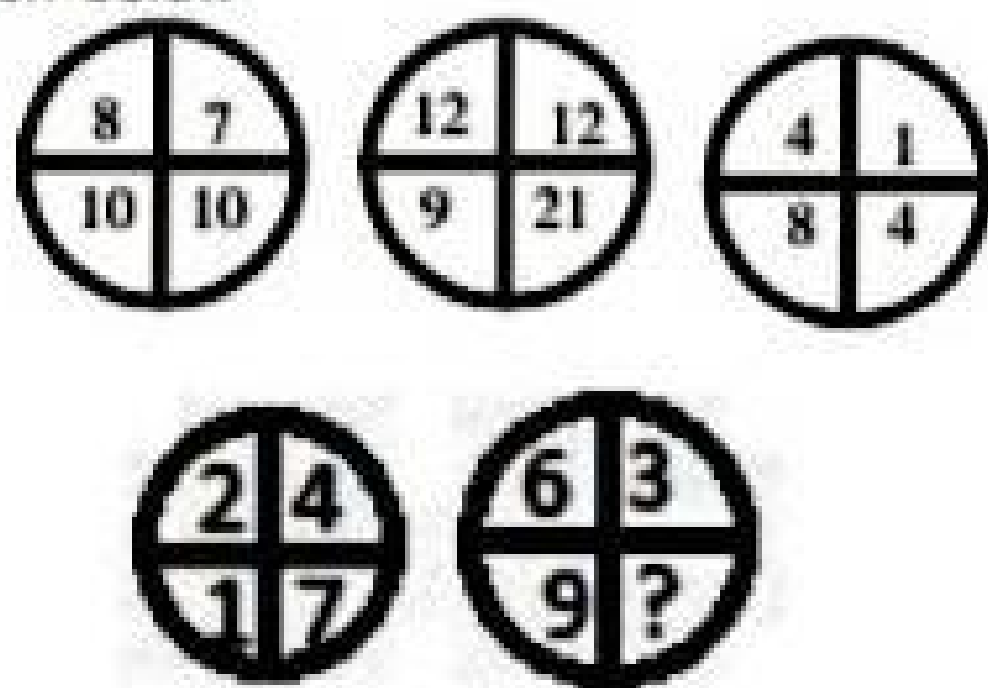
Some moons are planets.

Conclusions :

I. All moons are suns.

II. At least some moons are planets.

- (a) Either conclusion I or II is true
(b) Neither conclusion I nor II is true
(c) Both conclusions I and II are true
(d) Only conclusion II is true
59. Ten points are marked on a straight line and eleven points are marked on another straight line. How many triangles can be constructed with vertices from among the above points ?
(a) 495 (b) 550
(c) 1045 (d) 2475
60. The greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively is
(a) 123 (b) 127 (c) 235 (d) 305
61. Which number replaces the question mark in the figure given below



- (a) 11 (b) 6 (c) 3 (d) 21
62. **Statement - I :** Out of total of 200 readers, 100 read Indian Express, 120 read Times of India and 50 read Hindu.
Statement - II : Out of a total of 200 readers, 100 read Indian Express, 120 reads Times of India and 50 read neither.
How many people (from the group surveyed) read both Indian Express and Times of India ?
(a) The question can be answered with the help of Statement II, alone.
(b) Both, statement I and statement II are needed to answer the question.
(c) The questions can be answered with the help of statement I alone.
(d) The question cannot be answered even with the

help of both the statements.

63. If $137 + 276 = 435$, how much is $731 + 672$?
(a) 534 (b) 1403 (c) 1623 (d) 1531
64. Study the information carefully and answer the questions given below :
If we arrange the alphabets in the word "RATE" in the English alphabetical order, word "AERT" is formed. Then the third alphabet from the left in this word is "R". Similarly, from the word "OPEN" we get "ENOP" and the third alphabet from left is - "O". From the word "CHEF" we get - "CEFH" and the third alphabet from left is "F". From the word "TYER" we get - "ERTY" and the third alphabet from left is "T". From the word "TOY" we get - "OTY" and the third alphabet from left is "Y". If we use all these letters, then a meaningful English word "FORTY" can be formed.
Now find which of the following word set DOES NOT give a meaningful word in the similar way.
(a) SAME, ROOM, BEST, AUTO
(b) GOAT, PEST, WATT, ARMY
(c) MALE, FIND, LOST THAT
(d) JUMP, LIME, DUMB, SOME
65. Navjivan Express from Ahmedabad to Chennai leaves Ahmedabad at 6.30 AM and travels at 50 kmph towards Baroda situated 100 km away. At 7.00 AM Howrah-Ahmedabad Express leaves Baroda towards Ahmedabad and travels at 40 kmph. At 7.30 AM Mr. Shah, the traffic controller at Baroda, realizes that both the trains are running on the same track. How much time does he have to avert a head-on collision between the two trains ?
(a) 15 min (b) 20 min
(c) 25 min (d) 30 min
66. If the points $P(a^2, a)$ lie in the region corresponding to the acute angle between the lines and then
(a) $a \in (2, 6)$ (b) $a \in (4, 6)$
(c) $a \in (2, 4)$ (d) $a \in (10, 14)$
67. Some friends planned to contribute equally to jointly buy a CD player. However, two of them decided to withdraw at the last minute. As a result, each of the others had to shell out one rupee more than what they had planned for. If the price (in Rs.) of the CD player is an integer between 1000 and 1100, find the number of friend who actually contributed ?
(a) 44 (b) 23 (c) 21 (d) 46
68. Two liquids A and B are in the ratio 5 : 1 in container 1 and 1 : 3 in container 2 respectively. In what ratio should the contents of the two containers be mixed so as to obtain a mixture of A and B in the ratio 1 : 1 ?
(a) 2 : 3 (b) 4 : 3 (c) 3 : 2 (d) 3 : 4

69. Each family in a locality has at most two adults, and no family has fewer than 3 children. Considering all the families together, there are more adults than boys, more boys than girls, and more girls than families. Then the minimum possible number of families in the locality is
(a) 4 (b) 3 (c) 2 (d) 5
70. Fresh grapes contain 90% by weight while dried grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes ?
(a) 2.5 kg (b) 2.4 kg (c) 2 kg (d) 10 kg
71. A grocer sells half of the eggs that he has and another half an egg to Anurag. Then he sells half of the balance eggs and another half an egg to Deepak. Then he sells half of the balance eggs and another half an egg to Shivani. In the end he is left with just 7 eggs and he claims that he never broke an egg. How many eggs did he start with ?
(a) 65 (b) 63 (c) 67 (d) 69
72. There are eight poets, namely, P, Q, R, S, T, U, V and W in respect of whom questions are being asked in the examination. The first four are ancient poets and the last four are modern poets. The question on ancient and modern poets is being asked in alternate years. Those who like W also like V, those who like S like R also. The examiner who sets question is not likely to ask question on S because he has written an article on him. But he likes S. Last year a question was asked on U. Considering these facts, on whom the question is most likely to be asked this year ?
(a) Q (b) R (c) S (d) V
73. A team must be selected from the ten probable players – A, B, C, D, E, G, H, I and J. of these A, C, E and J are forwards, B, G and H are point guards and D, F and I are defenders. The team must have at least one forward, one point guard and one defender. If the team includes J it must also include F the team must include E or B, but not both if the team includes G, it must also include F. The team must include exactly one among C, G and I. C and F cannot be members of the same team. D and H cannot be members of the same team. The team must include both A and D or neither of them. There is no restriction on the number of members in the team. What could be the maximum size of the team that includes G ?
(a) 4 (b) 5 (c) 6 (d) More than 6
74. How many 4-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated ?
(a) 216 (b) 60 (c) 24 (d) 25
75. In a family of six persons, there are people from three generations. Each person has a separate profession and also they like different colours. There are two couples in the family. Mohan is a CA and his wife is neither a Doctor nor likes Green colour. Mohini is mother-in-law of Savita and she likes the Orange colour.

Engineer likes Red colour and his wife is a Teacher. Deepak is grandfather of Titu. Titu, who is a principal, like the Black colour Neeru is the granddaughter of Mohini and she likes blue colour. Neeru's mother likes the White colour. Savita is a

- (a) Doctor (b) Teacher
(c) Housewife (d) None of these

Questions 76, 77 and 78 are based on the following:

Twelve classmates A, B, C, D, E, F, G, H, I, J, K and L are sitting on a square table with 3 persons on each side. ABC and GJK are sitting on opposite sides. A and L are adjacent to each other but not on the same side. D and E are on the same side but not adjacent to each other. K is sitting diagonally opposite to C.

76. If F is sitting between D and E, who is sitting to the left of K?
(a) H (b) I (c) H or I (d) None
77. If H is sitting between I, and F, then he will be facing
(a) D (b) E (c) G (d) I
78. If G and E are facing C and H respectively, the neighbours of K are
(a) J and H (b) J and E
(c) H and J (d) H and E
79. The integers 34041, and 32506 when divided by a 3-digit integer n leave the same remainder. What is the value of n ?
(a) 289 (b) 307 (c) 367 (d) 493
80. The number of solid spheres, each of diameter 3cm that could be moulded to form a solid cylinder of height 54cm and diameter 4cm is
(a) 16 (b) 24 (c) 36 (d) 48
81. How many positive integers less than 10,000 are such that the product of their digits is 210?
(a) 36 (b) 42 (c) 48 (d) 54
82. Each of the five people, K, L, M, P and Q is of a different weight. It is known that the number of people heavier than P is the same as the number of people lighter than Q. L is the heaviest and K is not the lightest. Who is the lightest?
(a) M (b) L (c) Q (d) P
83. John, Johnny and Janardan participated in a race and each won a different medal among Gold, Silver and Bronze, not necessarily in that order. Each person among them gives two replies to any question, one of which is true and the other is false (in any order). When asked about the details of medals obtained by them, following were their replies:
John: I won the Gold medal. Johnny won the Bronze medal.
Johnny: John won the Silver medal. I won the Gold medal.
Janardan: Johnny won the Silver medal. I won the Gold medal.
Which among the following is the correct order of the

person who won the Gold medal, the Silver medal and the Bronze medal, respectively?

- (a) John, Johny, Janardan
- (b) Janardan, John, Johny
- (c) Johny, Janardan, John
- (d) Janardan, Johny, John

84. Each of A, B and C is a different digit among 1 to 9. How many different values of the sum of A, B and C are possible, if $ABA \times AA = ACCA$?

- (a) 1 (b) 3 (c) 7 (d) 8

85. In a certain code language, if the word 'BASKET' is coded as 'UFLTBC', then how is the word 'SIMPLE' coded in that language?

- (a) FMQNJT (b) FMQGNJ (c) FMQNJH (d) MFNQJT

DIRECTIONS FOR QUESTIONS 86 AND 87 ANSWER THE QUESTIONS ON THE BASIS OF THE INFORMATION GIVEN BELOW:

A, B, C, D, E, and F are a group of friends. There are two housewives, one professor, one engineer, one accountant and one lawyer in the group. There are only two married couples in the group. The lawyer is married to D, who is a housewife. No woman in the group is either an engineer or an accountant. C, the accountant, is married to F, who is a professor. A is married to a housewife. E is not a housewife.

86. What is E's profession?

- (a) Accountant
- (b) Lawyer
- (c) Professor
- (d) Engineer

87. How many members of the group are males?

- (a) 2 (b) 3
- (c) 4 (d) Can not be determined

88. Wrong number in the series 7, 8, 18, 57, 228, 1165, 6996

- (a) 228 (b) 18 (c) 57 (d) 8

DIRECTIONS FOR QUESTIONS 89 AND 90

Each of the questions given below consists of a statement and / or a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statement(s) is / are sufficient to answer the given question. Read the both statements and

- Give answer (U) if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question.
- Give answer (V) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question.
- Give answer (W) if the data either in Statement I or in Statement II alone are sufficient to answer the question.
- Give answer (X) if the data in both Statements I and II together are not sufficient to answer the question.
- Give answer (Y) if the data in both Statements I and II

together are necessary to answer the question.

89. How much time will the leak take to empty the full cistern?

- I. The cistern is normally filled in 9 hours.
- II. It takes one hour more than the usual time to fill the cistern because of a leak in the bottom.

- (a) V (b) U (c) X (d) Y

90. How long will it take to empty the tank if both the inlet pipe P_1 and the outlet pipe P_2 are opened simultaneously?

- I. P_1 can fill the tank in 16 minutes
- II. P_2 can empty the full tank in 8 minutes

- (a) X (b) U
- (c) Y (d) V

COMPUTER AWARENESS

91. If N is a 16-bit signed integer, the 2's complement representation of N is (F87B)₁₆. The 2's complement representation of $8 \times N$ is

- (a) (C3D8)₁₆ (b) (187B)₁₆
- (c) (F878)₁₆ (d) (987B)₁₆

92. The base (or radix) of the number system such that the following equation holds $312/20 = 13.1$ is

- (a) 3 (b) 4 (c) 5 (d) 6

93. Which of the following represents (D4)₁₆?

- (a) (4E)₁₆ - (5B)₁₆ (b) (14E)₁₆ - (7A)₁₆
- (c) (15C)₁₆ - (6D)₁₆ (d) (1E4)₁₆ - (A7)₁₆

94. How many Boolean expression can be formed with 3 Boolean variables?

- (a) 16 (b) 1024 (c) 32 (d) 256

95. In an 8 bit representation of computer system the decimal number 47 has to be subtracted from 38 and the result in binary 2's complement is

- (a) 11110111 (b) 10001001
- (c) 11111001 (d) 11110001

96. In IEEE single precision floating point representation, exponent is represented in

- (a) 8 bit Sign-magnitude representation
- (b) 8 bit 2's complement representation
- (c) Biased exponent representation with a bias value of 127
- (d) Biased exponent representation with a bias value of 128

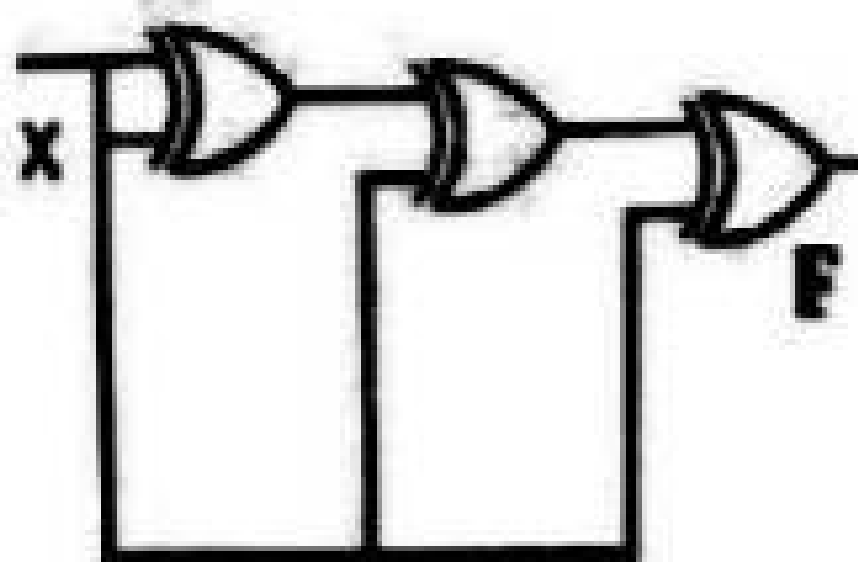
97. With 4-bit 2's complement arithmetic, which of the following addition will result in overflow?

- (a) 1111 + 1101 (b) 0110 + 0110
- (c) 1101 + 0101 (d) 0101 + 1011

98. If we can generate a maximum of 4 Boolean functions using n Boolean variables, what will be the minimum value of n?

- (a) 65536 (b) 16 (c) 1 (d) 4

99. If the 2's complement representation of a number is $(011010)_2$, what is its equivalent hex-adecimal representation?
 (a) $(110)_{16}$ (c) $(16)_{16}$ (b) $(1A)_{16}$ (d) $(26)_{16}$
100. For the circuit shown below, the complement of the output F is _____



- (a) 0 (b) X (c) X' (d) 1

GENERAL ENGLISH

101. There are two blanks in the sentences given below. From the pairs of words given below the sentence, choose the pair that fills the blanks most appropriately.
 Private companies supplying 'breakfast cereals' have started _____ in agriculture in poorer countries. This has _____ the spectre of land grabs and political conflicts.
 (a) Spending ... intensified (b) Dealing ... inflated
 (c) Ploughing ... increased (d) Investing ... raised
102. Use the appropriate phrasal verb and complete the sentence given below. The new system in education is aimed at the differences between rich and poor.
 (a) Goof around (b) Evening out
 (c) Glossing over (d) Give over

Read the following passage and answer questions Q. Nos.103, 104 and 105.

I have, myself, full confidence that if all do their duty, if nothing is neglected, and if the best arrangements are made, as they are being made, we shall prove ourselves once again able to defend our Island home, to ride out the storm of war, and to outlive the menace of tyranny, if necessary for years, if necessary alone. At any rate, that is what we are going to try to do. That is the resolve of His Majesty's Government - every man of them. That is the will of Parliament and the nation. The British Empire and the French Republic, linked together in their cause and in their need, will defend to the death their native soil, aiding each other like good comrades to the utmost of their strength. Even though large tracts of Europe and many old and famous States have fallen or may fall into the grip of the Gestapo and all the odious apparatus of Nazi rule, we shall not flag or fail. We shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air, we shall defend our Island, whatever the cost may be, we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender, and even if,

which I do not for a moment believe, this Island or a large part of it were subjugated and starving, then our Empire beyond the seas, armed and guarded by the British Fleet, would carry on the struggle, until, in God's good time, the New World, with all its power and might, steps forth to the rescue and the liberation of the old.

103. What does the term *ride out the storm* mean?
 (a) Handle a crisis successfully
 (b) Hide from a storm
 (c) Hide in some place where one cannot be found
 (d) Ride on a boat at the time of storm
104. What does *subjugate* mean?
 (a) surrender (b) compare (c) Control (d) abandon
105. "That is the resolve of His Majesty's Government." What is their resolve?
 (a) Surrender to the Nazis
 (b) Negotiate with the Nazis
 (c) Run away from the Nazis
 (d) Fight the Nazis
106. Select the most suitable antonym from the given choices for the word: "SANGFROID":
 (a) Equanimity (b) Steadiness
 (c) Aplomb (d) Turbulence
107. The word PIN is used in four different ways. Choose the option in which the usage of the word is incorrect or inappropriate.
 (a) She combed her hair backwards and secured it with a pin.
 (b) Jack managed to grab the thief and pin him against the wall until the police arrived on the scene.
 (c) It is imprudent to pin your hopes on someone to help you out of this situation.
 (d) You can't pin the blame at anyone without verifying facts
108. Pick the most appropriate substitute to the capitalized word in the following sentence.
 The weapon inspector's report was not expected to provide INCONTROVERTIBLE evidence of weapons of mass destruction.
 (a) Conclusive (b) Disputable
 (c) Inconvenient (d) Indecisive
109. In the sentence given below, a part of sentence is underlined. Four different ways of phrasing the underlined part are indicated as four choices. Choose the best alternative and mark its corresponding letter as your answer.
 A nation is built not by legislation but by the stirrings in the hearts of the people.
 (a) By legislation and by inspiration
 (b) Not by laws but by the excitement of the people
 (c) By law and by inciting the people
 (d) More by the passions in the hearts of the people than by laws

110. Select the most suitable synonym for the underlined word in the sentence. All the members of organization expressed implacable opposition to the move.
(a) Indignant (b) Adamant (c) Unified (d) Quixotic
111. Fill in the blank choosing the correct adjective: The phoenix is a _____ Bird.
(a) Mythical (b) Ethical (c) Natural (d) Carnivorous
112. Which of the following is the correct passive of the sentence. "JOHN HAS EATEN THE APPLES?"
(a) The apples are being eaten by John
(b) The apples are eaten by John
(c) The apples have been eaten by John
(d) The apples will be eaten by John.
113. Choose one of the words that is most nearly same as meaning of the given word Indemnify
(a) Insure (b) Compensate for loss
(c) Assure (d) Sue for damages
114. Select a word from the given alternatives which has the same meaning as the underlined word: He has a propensity for getting into debt.
(a) Tendency (b) Aptitude (c) Characteristic (d) Quality
115. Select the most suitable synonym from the given choices for the word: "ANTEDILUVIAN":
(a) Recluse (b) Maverick (c) Archaic (d) Bellicose
116. Choose a phrasal verb to replace the explanation in brackets:
"We must (be quick) _____ or we'll be late for school"
(a) Act up (b) Hurry up (c) Fasten on (d) Speed in
117. Anne had to pay for everything because as usual, Peter his wallet at home.
(a) had left (b) was leaving (c) Left (d) leave
118. Extreme old age when a man behaves like a child.
(a) Imbecility (b) senility (c) dotage (d) superannuation
119. Identify the word that means "To try to achieve something in difficult circumstances despite of setbacks".
(a) Persuade (b) Persevere
(c) Picturesque (d) Perspective
120. In the following a part of the sentence is underlined. Four different ways of phrasing the underlined part are indicated below. Choose the best alternative among the four choices given. When he entered the house, it was in sixes and sevens.
(a) It was six O' clock when he entered the house.
(b) Inmates were eulogized when he entered.
(c) House was in pandemonium.
(d) House was blissful.

Nimcet 2019

1. (a)	2. (a)	3. (d)	4. (c)	5. (d)	6. (c)	7. (c)	8. (j)	9. (b)	10. (a)
11. ()	12. (c)	13. (d)	14. (b)	15. (a)	16. (c)	17. (b)	18. (a)	19. (d)	20. (b)
21. (a)	22. (c)	23. (d)	24. (c)	25. (d)	26. (b)	27. (b)	28. (a)	29. (c)	30. (a)
31. (c)	32. (d)	33. (a)	34. (c)	35. (b)	36. (d)	37. (a)	38. (d)	39. (b)	40. (c)
41. (d)	42. (a)	43. (a)	44. (d)	45. (c)	46. (d)	47. (b)	48. (b)	49. (b)	50. (d)
51. (a)	52. (c)	53. ()	54. (a)	55. (a)	56. (b)	57. (c)	58. (d)	59. (c)	60. (b)
61. (c)	62. (a)	63. (c)	64. (d)	65. (b)	66. ()	67. (a)	68. (d)	69. (b)	70. (a)
71. (b)	72. (b)	73. (c)	74. (b)	75. (d)	76. (c)	77. (d)	78. ()	79. (b)	80. (d)
81. (d)	82. (a)	83. (b)	84. (c)	85. (a)	86. (d)	87. (b)	88. (a)	89. (d)	90. (c)
91. (a)	92. (c)	93. (b)	94. (d)	95. (a)	96. (c)	97. (b)	98. (c)	99. (b)	100. (d)
101. (d)	102. (b)	103. (a)	104. (c)	105. (d)	106. (d)	107. (d)	108. (a)	109. (d)	110. (b)
111. (a)	112. (c)	113. (b)	114. (a)	115. (c)	116. (b)	117. (a)	118. (c)	119. (b)	120. (c)