

1. In each of the following question there are five groups of letters four of them are alike in some manner, while one is different. Find out the different one.

- A. ACEG
- B. BDFH
- C. IKMO
- D. YACE

2. If α, β be the roots of equation $4x^2 - 7x + 3 = 0$ then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ will be

- A. $\frac{25}{12}$
- B. $\frac{23}{8}$
- C. $\frac{24}{25}$
- D. $\frac{24}{23}$

3. Without using any coins, can you determine below how many revolutions a coin will complete if it is rolled around another coin ? The coins are of same size.

- A. 1
- B. 2
- C. 3
- D. 5

4.  is to  as  is to

- A. 
- B. 
- C. 
- D. 

5. One white square is surrounded by four black squares, two white squares are surrounded by six black squares, three white squares are surrounded by 8 black squares. What is the largest possible number of white squares surrounded by n black squares?

- A. $\frac{n}{2} - 1$
- B. $\frac{n}{2} + 1$
- C. $n + 2$
- D. $2(n + 1)$

6. In the given series one term is missing. Choose the correct alternative that will continue the same pattern.

0, 2, 8, 14, (.....), 34

- A. 24
- B. 22
- C. 20
- D. 18

7. Which one of the following Venn diagrams correctly illustrates the relationship among the classes:
Elephants, Wolves, Animals?

- A. 
- B. 
- C. 
- D. 

8. A sum is being lent at 20% p.a. compound interest. What is the ratio of increase in amount of 4th year to 5th year?

- A. 4:5
- B. 5:4
- C. 5:6
- D. Can't be determined

9. The number of prime numbers less than 100 whose sum of the digits is 2, is _____.

- A. 1
- B. 2
- C. 3
- D. 4

10. Rational number between $\sqrt{2}$ and $\sqrt{3}$ is _____.

- A. $\sqrt{2} + \sqrt{3}$
- B. $\frac{\sqrt{2} \times \sqrt{3}}{2}$
- C. 1.5
- D. 1.8

11. The 100th root of $10(10^{10})$ is _____.

- A. $10^{8^{10}}$
- B. 10^{10^8}

C. $(\sqrt{10})^{(\sqrt{10})^{10}}$

D. $10^{(\sqrt{10})^{\sqrt{10}}}$

12. If $t = \frac{1}{1 - \sqrt[4]{2}}$, then t is equal to _____.

A. $(1 - \sqrt[4]{2})(2 - \sqrt{2})$

B. $(1 - \sqrt[4]{2})(2 + \sqrt{2})$

C. $-(1 + \sqrt[4]{2})(1 + \sqrt{2})$

D. $(1 + \sqrt[4]{2})(2 + \sqrt{2})$

13. If 1 is one of the zeroes of polynomial $x^2 - x + k$, then the value of k is _____.

A. -2

B. 0

C. 2

D. 4

14. The roots of the quadratic equation $3x^2 - kx + 14 = 0$ are in the ratio 7 : 6, then k equals _____.

A. 13

B. 12

C. 1

D. -3

If α and β are the zeroes of the polynomial $f(x) = x^2 + px + q$, then a polynomial having

15. $\frac{1}{\alpha}$ and $\frac{1}{\beta}$ as its zeroes is _____.

A. $x^2 + qx + p$

B. $x^2 - px + q$

C. $qx^2 + px + 1$

D. $px^2 + qx + 1$

If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 5x + k$ such that

16. $\alpha - \beta = 1$, then the value of k is _____.

A. -6

B. 5

C. -5

D. 6

17. The value of k for which the system of equations _____.

$$2x + 3y = 5$$

$$4x + ky = 10$$

has infinite number of solutions, is _____.

A. 1

B. 3

- C. 6
D. 0

18. If the system of equations

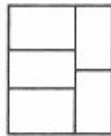
$$2x + 3y = 7$$

$$2ax + (a + b)y = 28$$

has infinitely many solutions, then _____.

- A. $a = 2b$
B. $b = 2a$
C. $a + 2b = 0$
D. $2a + b = 0$

19. A rectangle with perimeter 44 cm is partitioned into 5 congruent rectangles, as indicated in the diagram. The perimeter of each of the congruent rectangle is _____.



- A. 10 cm
B. 20 cm
C. 24 cm
D. 48 cm

The solution of the system of equations $\frac{2x + 5y}{xy} = 6$ and $\frac{4x - 5y}{xy} + 3 = 0$

20. (where $x \neq 0, y \neq 0$), is _____.

- A. $x = 1, y = 2$
B. $x = 0, y = 0$
C. $x = -1, y = 2$
D. $x = 1, y = -2$

21. The expression $4x^2 + 16x + m$ is divisible by $(x + 3)$. Then m is a divisor of _____.

- A. 4
B. 16
C. 20
D. 12

22. If $y = x + \frac{1}{x}$, then $x^4 + x^3 - 4x^2 + x + 1 = 0$ becomes _____.

- A. $x^2(y^2 + y - 6) = 0$
B. $x^2(y^2 + y - 2) = 0$
C. $x^2(y^2 + y - 3) = 0$
D. $x^2(y^2 + y - 4) = 0$

23. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots, is _____.

- A. 4

- B. 8
- C. 12
- D. 16

24. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then _____.

- A. $-3 < b < 3$
- B. $-2 < b < 2$
- C. $b > 2$
- D. $b < -2$

25. If $S = 1^2 - 2^2 + 3^2 - 4^2$ upto n terms and n is even, then S equals _____.

- A. $\frac{n(n+1)}{2}$
- B. $\frac{n(n-1)}{2}$
- C. $\frac{-n(n+1)}{2}$
- D. $\frac{-n(n-1)}{2}$

26. The number of terms common between the two series $2 + 5 + 8 + \dots$ upto 50 terms and the series $3 + 5 + 7 + 9 + \dots$ upto 60 terms is _____.

- A. 24
- B. 26
- C. 25
- D. 20

27. Let $a_1, a_2, \dots$ and $b_1, b_2, \dots$ be the arithmetic progressions such that $a_1 = 25$, $b_1 = 75$ and $a_{100} + b_{100} = 100$. The sum of the first one hundred terms of the progressions $(a_1 + b_1), (a_2 + b_2), \dots$ is _____.

- A. 0
- B. 100
- C. 10,000
- D. 5,05,000

28. If the sum of p terms of an A. P. is q and the sum of q terms is p , then the sum of $p + q$ terms is _____.

- A. 0
- B. $p - q$
- C. $p + 1$
- D. $-(p + q)$

29. In what ratio is the line segment joining the points $(-3, 2)$ and $(6, 1)$ is divided by Y-axis?

- A. 1: 3
- B. 2: 1
- C. 1: 2
- D. 3: 1

30. The two opposite vertices of a square are $(-1, 2)$ and $(3, 2)$, so the coordinates of the other two vertices are _____.

- A. $(6, 2), (-4, 2)$
- B. $(0, -2), (2, 4)$
- C. $(1, 0), (1, 4)$
- D. None of these

31. The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is _____.

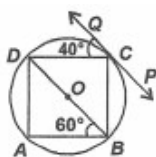
- A. $a^2 + b^2$
- B. $a + b$
- C. $a^2 - b^2$
- D. $\sqrt{a^2 + b^2}$

32. If $A(2, 2)$, $B(-4, -4)$ and $C(5, -8)$ are the vertices of a triangle, then the length of the median through vertex C is _____.

- A. $\sqrt{65}$ units
- B. $\sqrt{117}$ units
- C. $\sqrt{85}$ units
- D. $\sqrt{113}$ units

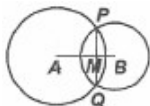
In the given figure, ABCD is cyclic quadrilateral and PQ is tangent to the circle with centre 'O'. BD is diameter, $\angle DCQ = 40^\circ$,

33. $\angle ABD = 60^\circ$. The $\angle BCP =$ _____.



- A. 50°
- B. 100°
- C. 60°
- D. 20°

34. In the figure, AB and PQ intersect at M. Then _____.



- A. $PM = MQ$
- B. $PQ \perp AB$
- C. Both (A) and (B)
- D. $PQ = AB$

In the given figure, O is the centre, $\angle OAB = 20^\circ$, $\angle OCB = 55^\circ$.

35. Then $\angle AOC$ is _____.



- A. 75°
- B. 70°
- C. 110°
- D. 40°

36. A bucket is in the form of a frustum of a cone, its depth is 15 cm and the diameters of the top and the bottom are 56 cm and 42 cm respectively. Find how many litres can the bucket hold.

- A. 13 litres
- B. 27 litres
- C. 42.94 litres
- D. 28.49 litres

37. If the radii of the circular ends of a bucket of height 40 cm are of lengths 35 cm and 14 cm, then the volume of the bucket in cubic centimetres, is _____.

- A. 60060
- B. 80080
- C. 70040
- D. 80160

38. A square park has each side 100 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 14 m. The area of the remaining part of the park is _____.

- A. 9548 m^2
- B. 9348 m^2
- C. 9384 m^2
- D. 9684 m^2

39. The mean of five numbers is 18. If one number is excluded, then their mean is 16, the excluded number is _____.

- A. 24
- B. 26
- C. 28
- D. 25

40. Three letters, to each of which corresponds an addressed envelope are placed in the envelopes at random. The probability that all letters are placed in the right envelopes is _____.

- A. $\frac{1}{3}$
- B. 1
- C. $\frac{1}{6}$
- D. 0

41. Which of the following is not a measure of central tendency?

- A. Mean
- B. Median

- C. Mode
- D. Standard deviation

42. The angles of depression of two ships from the top of a lighthouse are 45° and 30° towards east. If the ships are 100 m apart, the height of the lighthouse is _____.

- A. $\frac{50}{\sqrt{3}+1}m$
- B. $\frac{50}{\sqrt{3}-1}m$
- C. $50(\sqrt{3}-1)m$
- D. None of these

43. $\sqrt{\sec^2 \theta + \operatorname{cosec}^2 \theta} = \text{_____}.$

- A. $\tan \theta + \cot \theta$
- B. $\frac{\sec^2 \theta}{\operatorname{cosec}^2 \theta}$
- C. $\sec \theta + \operatorname{cosec} \theta$
- D. $\sec \theta - \tan \theta$

44. The angle of elevation of a cloud from a point 60 m above a lake is 30° and the angle of depression of its image in lake is 60° . The height of the cloud is _____.

- A. 100m
- B. 80m
- C. 40m
- D. 120m

45. “If all Fleeps are Sloops and all Sloops are Loopies, then all Fleeps are definitely Loopies”. This statement is

- A. True
- B. False
- C. Cannot say
- D. None of these

46. How would the following paper folded along the arrows and then punched would look when unfolded?



- A.
- B.
- C.

D. 

47. Finger is to palm as leaf is to _____.

- A. Tree
- B. Branch
- C. Blossom
- D. Twig

48. A man whose bowling average is 12.4 takes 5 wickets for 26 runs and thereby decreases his average by 0.4. The number of wickets, taken by him, before his last match, is _____.

- A. 85
- B. 78
- C. 72
- D. 64

49. A boy was asked to multiply a given number by $(8/17)$. Instead, he divided the given number by $(8/17)$ and got the result 225 more than what he should have got if he had multiplied the number by $(8/17)$. The given number was _____.

- A. 8
- B. 17
- C. 64
- D. 136

50. In a certain office, $(1/3)$ of the workers are women, $(1/2)$ of the women are married and $(1/3)$ of the married women have children. If $(3/4)$ of the men are married and $(2/3)$ of the married men have children, what part of workers are without children?

- A. $\frac{5}{18}$
- B. $\frac{4}{9}$
- C. $\frac{11}{18}$
- D. $\frac{17}{36}$