1. What is the logical negation of "All cats are mammals"?

a) Some cats are mammals. **b) Some cats are not mammals.**
c) No cats are mammals. d) d) All mammals are cats.

2. $(17)^{3.5} \times (17)^{?} = 17^{8}$

a) 2.29 **b) 2.75**
c) 4.25 d) 4.5

3. Find the nth term for the AP: 11, 17, 23, 29, …

a) 5 + 6 = 11 b) 5 + 12 = 17
c) Third term = 5 + 18 = 23 d) All the above

4. $\log_2(33 - 3^x) = 10^{\log(5-x)}$. Solve for x.

a) x = 5 **b) x = 2**
c) x = 4 d) x = -3

5. The graph of $y=x^2$ is a:

a) Straight line **b) Parabola**
c) Circle d) Hyperbola

6. If $x^2 + \frac{1}{x^2} = 34$, $x + \frac{1}{x}$ is equal to

a) 3 b) 4
c) 5 d) **None of these**

7. The perimeter of an equilateral triangle with side length 5 cm is:

a) 10 cm **b) 15 cm**
c) 20 cm d) 25 cm

8. The perimeter of a rectangle is 48 meters, and its area is 135 m2. The sides of the rectangle are

a) 15 m, 9m b) 19m, 5m
c) 45m, 3m d) 27m, 5m

9. If the equation $4x^2+x(p+1)+1=0$ has exactly two equal roots, one of the value of p is

a) 5 **b) -3**
c) 0 d) 3

10. The midpoint of the line segment joining (2,3) and (6,7) is:

a) (3,4) **b) (4,5)**
c) 3/2 d) (6,8)

11. Find the value of x in equation given $8^{x+1} - 8^{x-1} = 63$

a) x = 1 b) x = 0
c) x = -1 **d) x = -3**

12. Find the value of x for the eq. given $\log_{0.25} x = 16$

a) $x = 4^{-16}$ b) $x = 4^{-12}$
c) $x = 4^{-18}$ **d) $x = 4^{-14}$**

13. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

a) 145° b) 150°
c) 155° d) 160°

14. For elements 4 and 6, verify that $A \geq G \geq H$

a) $A \geq G < H$ b) $A < G \geq H$
c) $A \geq G \geq H$ d) $A > G > H$

15. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 59.29, the number of the member is the group is:

a) 57 b) 67
c) 77 d)87

16. The line $3x + y - 9 = 0$ divides the line joining the points (1, 3) and (2, 7) internally in the ratio

a) 3:04 b) 3:02
c) 2:03 **d) 4 : 3**

17. Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:

a) 9 b) 11
c) 13 **d) 15**

18. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?

a) 7 b) 10
c) 12 d) 13

19. If 5a = 3125, then the value of 5(a - 3) is:

a) 25 b) 125
c) 625 **d) 1625**

20. If y>0, which of these values of x is NOT in the domain of this equation?

a) 2 b)-1
c) -2 d) ½

21. A triangle has angles 45°, 45°, and 90°. What kind of triangle is it?

a) Equilateral **b) Isosceles**
c) Scalene d) Right-angled

22. What is the nineteenth term of an AP if the first term is 25 and common difference is 6?

a) 133 b) 135
c) 126 d) 132

23. Convert decimal **25** to binary:

a) 11001 b) 10001
c) 10101 d) 11011

24. The value of sin 30◦ is:

a) 1 **b) 1/2**
c) √3/2 d) 0

25. If log 2 = 0.3010 and log 3 = 0.4771, the value of $\log_5 512$ is:
a)2.870 b)2.967
c) 3.876 d) 3.912

26. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 59.29, the number of the member is the group is:
a) 57 b) 67
c) 77 d)87

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c) 12 d) 13

30. If 5a = 3125, then the value of 5(a - 3) is:
a) 25 b) 125
c) 625 **d) 1625**

31. A mass m is moving with a constant velocity along a line parallel to the x-axis, away from the origin. Its angular momentum with respect to the origin_____

a) Is zero **b) Remains constant**
c) Goes on increasing d) Goes on decreasing

32. If X =(0.25)1\2, Y = (0.4)2, Z=(0.216)1/3, then _____ .
a) Y>X>Z **b) X>Y>Z**
c) Z>X>Y d) X>Z>Y

33. Look carefully for the pattern, and then choose which pair of numbers comes next.

42 40 38 35 33 31 28

a) 25 22 b) 26 23
c) 26 24 **d) 25 23**

34. The rationalize factor of 3√3 is _____.
a) 1by3 b) 3
c) -3 **d) √3**

35. CMM, EOO, GQQ, _____, KUU
a) GRR b) GSS
c) ISS d) ITT

36. Decimal equivalent of binary number 1010 is?
a) 11 b) A
c) 10 d) None of the mentioned

37. What smallest number should be added to 4456 so that the sum is completely divisible by 6 ?
a) 4 b) 3
c) 2 d) 1

38. There is bag of lots of integers from 1 to 10000, but you can only pick the numbers that are of 3-digit and also divisible by 3. What maximum sum of numbers you can pick.
a) 165150 b) 1600843

c) 168132420 d) 165322501

39. What is the nineteenth term of an AP if the first term is 25 and common difference is 6?

a) 133 b) 135

c) 126 d) 132

40. If $f(x)=3x^2-5x+2$, then the value of $f'(x)$ is:

a) $6x-5$ b) $6x+5$

c) $3x-5$ d) $3x^2-5$

41. The least value of $2\sin 2\theta + 3\cos 2\theta$

a) 1/3 b) 4/3

c) 2 d) 3/4

42. In a right-angled triangle, one leg has a length of 6 cm and the other leg has a length of 8 cm. What is the length of the hypotenuse?

a) 8 cm **b) 10 cm**

c) 14 cm d) 12 cm

43. A mass m is moving with a constant velocity along a line parallel to the x-axis, away from the origin. Its angular momentum with respect to the origin _____

a) Is zero **b) Remains constant**

c) Goes on increasing d) Goes on decreasing

44. Three friends, Alex, Bob, and Carl, are standing in a row. Alex is not the tallest, and Carl is not the shortest. Who is the tallest?

a) Alex **b) Bob**

c) Carl d) It is impossible to determine

45. A person walks 10 km towards the north. He then turns left and walks 5 km. He then turns left again and walks 10 km. After this, he turns right and walks 10 km. In which direction is he now from his starting point?

a) North-East b) North-West

c) South-East **d) South-West**

46. What is the negation of the statement "If it rains, then I will take an umbrella"?

a) If it rains, I will not take an umbrella. b) It rains and I do not take an umbrella.

c) It does not rain, and I do not take an umbrella. **d) It rains, but I do not take an umbrella.**

47. In a group of 200 people, 60 like pizza, 50 like burgers, and 30 like both pizza and burgers. If a person is selected at random from the group, what is the probability that the person likes only burgers?

a) 0.1 b) 0.15

c) 0.2 d) 0.25

48. The vertices of a triangle are (1, 2), (3, 4), and (5, 6). What is the equation of the line passing through the midpoint of the segment connecting (1, 2) and (3, 4) and the midpoint of the segment connecting (3, 4) and (5, 6)?

a) y = x b) y = -x

c) y = 2x - 1 d) y = -2x + 7

49. In a Venn diagram, the intersection of two sets A and B represents:

a) All elements in A or B **b) All elements in both A and B**

c) All elements in neither A nor B d) All elements not in A or B

50. A sector of a circle has a central angle of 60°. If the radius of the circle is 12 cm, what is the area of the sector?

a) 24 cm^2 b) 36 cm^2
c) 48 cm^2 d) 72 cm^2

51. A farmer has 15 cows and 12 goats. He wants to divide them into equal groups, with no animals left over. What is the greatest number of groups he can make?

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

52. A bat and a ball together cost $1.10. The bat costs $1.00 more than the ball. How much does the ball cost?

a) $0.01 **b) $0.05**
c) $0.10 d) $0.50

53. A survey reveals that 50 students in a class like playing cricket, 30 like playing football, and 20 like playing both cricket and football. What is the number of students who like either cricket or football, but not both?

a) 40 b) 30
c) 20 d) 10

54. A person starts walking from point A in the North-East direction. After walking 15 meters, he turns 90° to the left and walks 20 meters. Then, he turns 45° to the right and walks 15 meters. In which direction is he now from his starting point?

a) North-West b) South-West
c) North-East d) South-East

55. In a survey of 100 people, 40 like tea, 30 like coffee, and 20 like both tea and coffee. What is the probability that a randomly chosen person from the survey likes either tea or coffee?

a) 0.4 **b) 0.5**
c) 0.6 d) 0.7

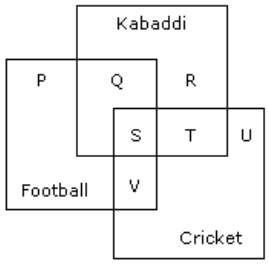
56. A person starts at point P and walks 10 meters towards the North. Then, he turns to his right and walks 6 meters, followed by another right turn and walks 10 meters. What is the shortest distance between his current position and point P?

a) 6 meters b) 10 meters
c) 16 meters d) 20 meters

57. In a class of 60 students, 40 play cricket, 30 play football, and 20 play both cricket and football. How many students do not play either cricket or football?

a) 0 **b) 10**
c) 20 d) 30

58. The diagram given below represents those students who play Cricket, Football and Kabaddi.



Study the diagram and identify the students who play all the three games.

a) P + Q + R b) V + T
c) S + T + V **d) S**

59. If ‘north’ is called ‘south’, ‘east’ is called ‘west’, ‘south’ is called ‘east’ and ‘west’ is called ‘north’, then what is the direction of South-West?

a) East
b) North
c) West
d) South

60. In a family of six members A, B, C, D, E, and F, there are two married couples. A is the father of B. C is the brother of D and is married to E. D is the father of F. How is E related to F?

a) Mother
b) Sister
c) Aunt
d) Mother-in-law

61. A man is driving a car at a constant speed of 60 km/hr. He passes a school and sees a boy running on the sidewalk at a speed of 10 km/hr in the same direction as his car. How fast is the boy moving relative to the car?

a) 10 km/hr
b) 20 km/hr
c) 30 km/hr
d) 40 km/hr

62. What is the result of adding the binary numbers 1011 and 1101?

a) 10100
b) 10010
c) 10000
d) 11110

63. What smallest number should be added to 4456 so that the sum is completely divisible by 6 ?

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

64. If xyz = 10 , then solve $\log(x^n y^n / z^n) + \log(y^n z^n / x^n) + \log(z^n x^n / y^n)$

a) n
b) 1
c) -n
d) 0

65. Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:

a) 1 : 3
b) 3 : 2
c) 3 : 4
d) None of these

66. A man walks 10 meters towards East, then turns to his right and walks 15 meters. He then turns to his left and walks 20 meters. Finally, he turns to his left and walks 15 meters. In which direction is he now from his starting point?

a) North
b) South
c) East
d) West

67. In dividing a number by 585, a student employed the method of short division. He divided the number successively by 5, 9 and 13 (factors 585) and got the remainders 4, 8, 12 respectively. If he had divided the number by 585, the remainder would have been

a) 24
b) 144
c) 292
d) 584

68. The least value of $2\sin2\theta + 3\cos2\theta$

a) 1/3
b) 4/3
c) 2
d) 3/4

69. The equation $3x^2-5x+2=0$ has how many real roots

a) One
b) Two
c) Zero
d) Infinite