MATHEMATICS

1. The mean of 100 observations is 50 and their standard deviation is 5. The sum of all squares of all the observations is
   A. 5000   B. 250000   C. 252500   D. None of these

2. Consider the first 10 positive integers. If we multiply each number by (-1) and then add 1 to each number, the variance of the numbers so obtained is
   A. 8.25   .   B. 6.5   C. 3.87   D. 2.87

3. The standard deviation of some temperature data in ^0C is 5. If the data is converted into ^0F, the variance will be
   A. 81   B. 57   C. 36   D. 25

4. ABC and BDE are two equilateral triangles such that D is the midpoint of BC. Ratio of the areas of Triangles ABC and BDE is
   A. 2:1   B. 1:4   C. 1:2   D. 4:1

5. In a triangle ABC, D and E are points on sides AB and AC respectively such that DE is parallel to BC, and AD:DB=3:1, IF EA=6.6cm then find AC
   A. 2.2 cm   B. 8.8cm   C. 4.4cm   D. None of these

6. A cube whose edge is 20cm long, has circles in each of it's faces painted black. What is the total area of the unpainted surface of the cube if the circles are of the largest possible areas? (taken $\pi=3.14$)
   A. 515 cm^2 B. 514 cm^2 C. 516 cm^2 D. None of these

7. The length of a swimming pool is 90m and breadth is 40m. 150 men take a dip. If the average displacement of water by a man is 8m^3, then rise in water level of the pool is
   A. 27.33m   B. 33.33m   C. 31.33m   D. 30m

8. The number of coins having 1.5 cm as diameter and 0.2 cm thick to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm is
   A. 350   B. 400   C. 500   D. 450

9. Positive value of P for which the equation $x^2+Px+64=0$ and $x^2-8x+P=0$ have real roots is
   A. P=16   B. P$\leq$16   C. P$\geq$16   D. None of these

10. If the equation x^2-kx+1, have no real roots, then

    A. $-3<K<3$ B. $-2<K<2$ C. Both a and b   D. None of these

11. If the sum of first n terms of a Arithmetic progression is $An+Bn^2$ where A and B are constants, then find the common difference of the A.P.

    A. A+B   b. 2B   C. A-B   D. 2A

12. In a right angle triangle ABC, given that 15 Cot A = 8, find Sec A

    A. $\dfrac{17}{8}$ B. $\dfrac{8}{17}$ C. $\dfrac{15}{17}$ D. None of these

13. Let N= 1421 X 1423 X 1425. What is the remainder when N is divided by 12?

    A. 0   B. 9   C. 3   D. 6

14. Three numbers are in the ratio 1:2:3 and HCF is 12. The numbers are

    A. 6,12,18   B. 12,24,36   C. 24,48,72   D. None of these

15. $2x-3y=-1$

    $6x-9y=-4$

    The above two equations have

    A. exactly one solutions

    B. infinitely many solutions

    C. no solutions

    D. none of these

16. In the list of numbers 5, 11, 17, 23, 29....... find out the position of the number 305.

    A. 51st   B. 52nd   c. 49th   d. 50th

17. Select the correct option from the following:

    Statement: 1: Real numbers are always closed under division.

    Statement: 2: Integers under subtraction satisfies commutative law.

    A. 1 is true but 2 is false

    B. 1 is false but 2 is true

    C. Both are true

    D. None of these

18. The LCM of two co-prime numbers is 870. If one number is 29, find the other number.

    A. 31   B. 37   C. 30   D. 27

19. If the zeros of a quadratic polynomial are -3 and 2, then the polynomial is
   A. x^2+3x+3
   B. x^2+5x+3
   C. x^2+2x+3
   D. None of these

20. The co-ordinates of two opposite vertices of a square are (-1,-2) and (0,-1). The other two vertices ae
   A. (-1,-1),(0,-2)
   B. (-1,0),(1,2)
   C. (1,2),(0,-2)
   D. (1,-1), (1,2)

21. The equation of a line making an angle 45^0 with positive X-axis and intersecting axis at (0,6) is
   A. y=x-2
   B. Y-6=x
   C. Y=x-6
   D. None of these

22. In a number of two digits, the digit in the tenth place is twice of it's unit place. If 36 is subtracted from the number, the digits are reversed. The number is
   A. 48
   B. 42
   C. 63
   D. 84

23. A bag contains 10 white balls and 8 red balls. Two balls are drawn one by one at random with replacement. Find the probability that first ball is red and second ball is white.
   A. $\dfrac{40}{153}$
   B. $\dfrac{306}{316}$
   C. $\dfrac{40}{306}$
   D. None of these

24. Seven un-biased coins are tossed. Find the probability of getting at least one tail.
   A. $\dfrac{1}{128}$
   B. $\dfrac{127}{128}$
   C. $\dfrac{64}{128}$
   D. None of these

25. A tower stands vertically on the ground. From a point on the ground, which is 15 meter away from the foot of the tower. The angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.
   A. $12\sqrt{3}$
   B. $15\sqrt{2}$
   C. $15\sqrt{3}$
   D. $12\sqrt{2}$