1. The order of the differential equation of all circles whose radius is 4, is
(A) 1
(B) 2
(C) 3
(D) 4

2. The intercept on the line y = x by the circle $x^2 + y^2 - 2x = 0$ is AB. The equation of the circle with AB as a diameter is
(A) $x^2 + y^2 + x + y = 0$
(B) $x^2 + y^2 - x - y = 0$
(C) $x^2 + y^2 - 3x + y = 0$
(D) $x^2 + y^2 + 3x - y = 0$

3. Which of the following statements is contingency?
(A) (p V q) V ~ q
(B) (p V q) V ~ p
(C) (p V q) ∧ ~ q
(D) p —> (p V q)

4. It is observed that 25 % of the cases related to child labour reported to the police station are solved. If 6 new cases are reported, then the probability that atleast 5 of them will be solved is
(A) $(1/4)^6$
(B) 19/1024
(C) 19/2048
(D) 19/4096

5. A bag contains 6 white and 4 black balls. Two balls are drawn at random. The probability that they are of the same colour is

(A) 5/7
(B) 1/7
(C) 7/15
(D) 1/15

6. If the foot of the perpendicular drawn from the point (0,0,0) to the plane is (4,-2,-5) then the equation of the plane is
(A) 4x + 2y + 5z = -13
(B) 4x - 2y - 5z = 45
(C) 4x + 2y - 5z = 37
(D) 4x - 2y + 5z = -5

7. A stone is dropped into a pond. Waves in the form of circles are generated and the radius of outermost ripple increases at the rate of 5 cm/sec. Then area increased after 2 seconds is
(A) 100 Π cm2/sec
(B) 40cm2/sec
(C) 50cm2/sec
(D) 25cm2/sec

8. If G (3,-5,r) is centroid of triangle ABC where A (7,-8,1), B (p,q, 5) and C (q+1,5p,0) are vertices of a triangle then values of p,q,r are respectively
(A) 6 , 5 , 4
(B) -4 , 5 ,4
(C) -3 , 4 , 3
(D) -2 , 3 , 2

9. A particle moves so that $x = 2 + 27t - t^3$. The direction of motion reverses after moving a distance of ……. units.

(A) 80
(B) 56
(C) 60
(D) 65

10. Which of the following equations has no solution ?
(A) sec θ= 23
(B) cosθ = √2
(C) tanθ = 2019
(D) sinθ = -1/5

11. Using Differentiation, approximate value of f(x) = x2 - 2x + 1 at x = 2.99 is
(A) 3.96
(B) 9.96
(C) 4.98
(D) 5.98

12. If the sum of an infinite G.P be 9 and sum of first two terms be 5 then their common ratio is
(A) 1/3
(B) 3
(C) 2/3
(D) 3/2

13. if three dice are thrown then the probability that the sum of the numbers on their uppermost faces to be at least 5 is
(A) 1/53
(B) 53/54
(C) 1/54

(D) 52/53

14. The joint equation of the lines passing through the origin and trisecting the first quadrant is
(A) $\sqrt{3}x^2 - 4xy + \sqrt{3}y^2 = 0$
(B) $x^2 + \sqrt{3}xy - y^2 = 0$
(C) $3x^2 - y^2 = 0$
(D) $x^2 - \sqrt{3}xy - y^2 = 0$

15. If the lengths of the transverse axis and the latus rectum of a hyperbola are 6 and 8/3 respectively, then the equation of the hyperbola is
(A) $4x^2 - 9y^2 = 72$
(B) $4x^2 - 9y^2 = 36$
(C) $9x^2 - 4y^2 = 72$
(D) $9x^2 - 4y^2 = 36$

16. The area of the region enclosed between the pair of lines xy = 0 and the lines xy + 5x - 4y - 20 = 0, is
(A) 20 Square Units
(B) 4/5 Square Units
(C) 10 Square Units
(D) 6 Square Units

17. If f(x) = 3x3 - 9x2 - 27x + 15, then the maximum value of f(x) is
(A) -66
(B) 30
(C) -30
(D) 66

18. If A is non-singular matrix and (A + I) (A - I) = 0 then A + $A^{-1}$ =
(A) 2A
(B) 0
(C) I
(D) 3 I

19. The y-intercept of the line passing through A (6,1) and perpendicular to the line x - 2y = 4 is
(A) 5
(B) 13
(C) -2
(D) 26

20. The minimum value of z = 10x +25y subject to $0 \leq x \leq 3$, $0 \leq y \leq 3$, $x+y \geq 5$ is
(A) 80
(B) 95
(C) 105
(D) 30

21. If A,B,C and D are (3,7,4), (5,-2,3), (-4,5,6) and (1,2,3) respectively, then the volume of the parallelepiped with AB, AC and AD as the co-terminus edges, is ……. cubic units.
(A) 91
(B) 94
(C) 92
(D) 93

22. The maximum value of z = 6x + 8y subject to $x - y \geq 0$, $x + 3y \leq 12$, $x \geq 0$, $y \geq 0$ is …….

(A) 72
(B) 42
(C) 96
(D) 24

23. In a binomial distribution, mean is 18 and variance is 12 then p =
(A) 2/3
(B) 1/3
(C) 3/4
(D) 1/2

24. The number of principal solutions of tan $2\theta = 1$ is
(A) One
(B) Two
(C) Three
(D) Four

25. The maximum value of $f(x) = \log x / x$ $(x \neq 0, x \neq 1)$ is
(A) e
(B) 1/e
(C) $e^2$
(D) $1/e^2$

26. If lines represented by equation $px^2 - qy^2 = 0$ are distinct then
(A) $pq > 0$
(B) $pq < 0$
(C) $pq = 0$
(D) $p + q = 0$

27. If slopes of lines represented by $Kx^2 + 5xy + y^2 = 0$ differ by 1 then K =
(A) 2
(B) 3
(C) 6
(D) 8

28. The particular solution of a differential equation xdy +2dyx = 0 when x = 2, y = 1 is
(A) xy = 4
(B) $x^2y = 4$
(C) $xy^2 = 4$
(D) $x^2y^2 = 4$

29. A boy tosses fair coin 3 times. If he gets ₹ 2X for X heads then his expected gain equals to ₹
(A) 1
(B) 2/3
(C) 3
(D) 4

30. The area of the region bounded by the lines y = 2x + 1, y = 3x + 1 and x = 4 is
(A) 16 square unit
(B) 121/3 square unit
(C) 121/6 square unit
(D) 8 square unit