Aimstutorial Model guess paper-3

MATHS - 1B

(Board of Intermediate Education Model Paper)

SECTION - A

I. Answer ALL the following Very Short Answer Questions:

 $[10 \times 2 = 20]$

- 1. Transform the equation $\sqrt{3}$ x+y=4 in to (i) slope intercept form (ii) Intercept form
- 2. Find the value of P if the straight lines 3x+7y-1=0 and 7x-py+3=0 are mutually perpendicular.
- 3. Show that the points (1,2,3), (7,0,1),(-2,3,4) are collinear.
- 4. Reduce the equation x+2y-3z-6=0 of the plane to the normal form.
- 5. Compute the limit of $\underset{x\to 3}{\text{Lt}} \frac{x^2 8x + 15}{x^2 9}$
- 6. Evaluate $\underset{x\to 0}{\text{Lt}} \frac{e^x \sin x 1}{x}$
- 7. Find the derivative of sin-1(3x-4x³) with respect of 'x'
- 8. If $2x^2-3xy+y^2+x+2y-8=0$ then find $\frac{dy}{dx}$.
- 9. Find dy and Δ y of y = f(x) = x^2+x at x = 10 when Δ x=0.1
- 10. Find the length of subtangent at a point on the curve $y = bsin\left(\frac{x}{a}\right)$

SECTION - B

II. Answer any FIVE of the following Short Answer Questions:

 $[5 \times 4 = 20]$

- 11. Find the equation of locus of a point, the sum of whose distance from (0,2) and (0,-2) is 6.
- 12. When the origin is shifted to the point(2,3) the transformed equation of a curve is $x^2+3xy-2y^2+17x-7y-11=0$. Find the original equation of curve.
- 13. Find the equation of the straight line parallel to the line 3x+4y=7 and passing through the point of intersection of the lines x-2y-3=0, x+3y-6=0.

14. Check the continuity of 'f' given by
$$f(x) = \begin{cases} 4-x^2 & \text{if } x \le 0 \\ x-5 & \text{if } 0 < x \le 1 \\ 4x^2-9 & \text{if } 1 < x < 2 \\ 3x+4 & \text{if } x \ge 2 \end{cases}$$

- 15. $X = a(\cos t + \sin t)$, $y=a(\sin t \cos t)$ find $\frac{dy}{dx}$.
- 16. Find the equation of tangent and normal to the curve y = 2. $e^{\frac{-x}{3}}$ at the point where the curve meets the Y axis.
- 17. A point P is moving on the curve $y=2x^2$. The x coordinates of P is increasing at the rate of 4 units per second. Find the rate at which y co-ordinates is uncreasing when the point is at (2,8).

SECTION - C

III. Answer any FIVE of the following Long Answer Questions.:

 $[5 \times 7 = 35]$

- 18. The base of an equilateral traingle is x+y-2=0 and opposite vertex is (2,-1) Find the equation of the remaining sides.
- 19. If the second degree equation $S = ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ in two variables x and y represents a pair of straight lines, then prove that. (a) $abc + 2fgh af^2 bg^2 ch2 = 0$ (b) $h^2 \ge ab$, $f^2 \ge bc$, $g^2 \ge ac$.
- 20. Find the lines joining the origin with the points of intersection of the curv $7x^2-4xy+8y^2+2x-4y-8=0$ with the straight line 3x-y=2 and also the angle between them.
- 21. Find the direction cosines of the two lines which are connected by the relations l-5m+3n=0, $7l^2+5m^2-3n^2=0$.
- 22. If $x^y+y^x=a^b$ then prove that $\frac{dy}{dx} = -\left[\frac{yx^{y-1} + y^x \log y}{x^y \log x + xy^{x-1}}\right]$
- 23. If the curved surface of right circular cylinder inscrided in a sphere of radius 'r' is maximum, show that the height of the cylinder is $\sqrt{2}$ r.
- 24. If $ax^2+by^2=1$, $a_1x^2+b_1y^2=1$, then show that the condition for orthogonality of above curves is

$$\frac{1}{a} - \frac{1}{b} = \frac{1}{a_1} - \frac{1}{b_1}$$
