Aimstutorial Model Guess paper-4

MATHS - 1B

(Board of Intermediate Education Model Paper)

SECTION - A

I. Answer ALL the following Very Short Answer Questions:

- 1. Find the equation of the straight line perpendicular to the line 5x-3y+1=0 and passing through the point (4,-3)
- 2. Find the equation of the straight line passing through (-4,5) and cutting off equal intercepts on the coordinates axes.
- 3. Shoe that the points (1,2,3), (2,3,1) and (3,1,2) form an equilateral traingle.
- 4. Write the equation of the plane 4x-4y+2z=0 in the intercept form.
- 5. Evaluate $\underset{x\to 0}{\text{Lt}} \frac{e^x 1}{\sqrt{1 + x} 1}$
- 6. Evaluate $\lim_{x \to 2} \left\{ \frac{1}{x-1} \frac{4}{x^2 4} \right\}$
- 7. Find the derivatives of $7^{x^3} + 3x$.
- 8. If $y=ax^{n+1}+bx^{-n}$ then show that $x^2-y^{n}=n(n+1)y$.
- 9. If the increase in the side of a square is 4% then find the approximate percentage of increase in the area of the square.
- 10. Verify Rolles' theorem for the function $f(x)=x^2-5x+6$ in the interval [-3,8]

SECTION - B

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

- 11. Find the equation of locus of a point p, if the distance of P from A(3,0) twice the distance of P from B(-3,0).
- 12. When the axes are roated through an angle 45° , the transformed equation of a curve is $17x^2-16xy+17y^2=225$. find the original equation of the curve.
- 13. Find the value of k if the angle between the straight lines 4x-y+7=0, kx-5y-9=0 is 45°

14 If f is given by
$$f(x) = \begin{cases} k^2 \ x - k \ if \ x \ge 1 \\ 2 \ if \ x < 1 \end{cases}$$
 is a Continous function on R, Then Find K.

- 15. Find the derivative of sin2x from the first principles.
- 16. The radius of a circle is increasing at the rate of 0.7 cm/sec/what is the rate of increase of its circumcentre.
- 17. Find the value of k, so that the length of the subnormal at any point on the curve $y=a^{1-k}x^k$ is a constant.

[10 x 2 = 20]

[5 x 4 = 20]

SECTION - C

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

- 18. Find the circumcenter of the traingle whose vertices are (-2,3),(2,-1),(4,0).
- 19. Prove that the equation $3x^2+7xy+2y^2+5x+5y+2=0$ represents a pair of straight lines and find the coordinates of the point of intersection.
- 20. Find the angle between the lines joining the origin to the points of intersection of the curve $x^2+2xy+y^2+2x+2y-5=0$ and the line 3x-y+1=0
- 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
$$\sqrt{1-x} + \sqrt{1-y} = a(x-y)$$
 then prove that $\frac{dy}{dx} = \frac{\sqrt{1-y}}{\sqrt{1-x}}$

- 23. If the tangent at a point on the curve $x^{2/3}+y^{2/3}=a^{2/3}$ intersects the coordinates axes in A and B then show that the length AB is a constant.
- 24. Find the maximum area of the rectangle that can be formed with fixed perimeter 20 units.

[5 x 7 = 35]