Aimstutorial Model Guess Paper-6

MATHS - 1B

(Board of Intermediate Education Model Paper)

SECTION - A

I. Answer ALL the following Very Short Answer Questions:

 $[10 \times 2 = 20]$

- 1. Find the slope of the line x+y=0 and x-y=0.
- 2. Transform the equation x+y+1=0 into Normal form.
- 3. If (3,2-1), (4,1,1) and (6,2,5) are three vertices and (4,2,2,) is the centroid of a tetrahedron find the fourth vertex.
- 4. Find the angle between the planes 2x-y+z=6 and x+y+2x=7
- 5. Evaluate $\underset{x\to 0}{\text{Lt}} \frac{e^{7x}-1}{x}$
- 6. Compute $\lim_{x \to \infty} \frac{x^2 + 5x + 2}{2x^2 5x + 1}$
- 7. Find the derivative of 5sinx+e^xlogx
- 8. Find the derivative of sec-1 $\left(\frac{1}{2x^2-1}\right)$, $\left(0 < x < \frac{1}{\sqrt{2}}\right)$
- 9. Find Δ y and dy of the function y = x^2+x , for the values x=10 and Δ x=0.1.
- 10. Verify Rolle's theorem for the function $y=f(x)=x^2+4$ on [-3, 3]

SECTION - B

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

 $[5 \times 4 = 20]$

- 11. A(1,2), B(2,-3) and c(-2,3) are three points. A point P moves such that: $PA^2 + PB^2 = 2PC^2$. show that the equation to the locus of P is 7x-7y+4=0
- 12. When the axes are rotated through an angle $\pi/4$, Find the transformed equation of $3x^2+10xy+3y^2=9$
- 13. Find the value of P, if the lines 3x+4y=5,2x+3y=4, px+4y=6 are concurrent

14. Check the continuity of the following function at 2.
$$f(x) = \begin{cases} \frac{1}{2}(x^2 - 4) & \text{if } 0 < x < 2 \\ 0 & \text{if } x = 2 \end{cases}$$

$$2 - 8 x^{-3} \quad \text{if } x > 2$$

- 15. Find the derivative of cotx from the first principle.
- 16. A particle is moving in a straight line so that after t seconds its distance s (in cms) from a fixed point on the line is given by s=f(t)=8t+t³. find (i) the velocity at time t=2 sec (ii) The initial velocity (iii) acceleration at t = 2 sec.
- 17. Find the equations of the tangent and normal to the curve xy=10 at (2,5)

SECTION - C

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

 $[5 \times 7 = 35]$

- 18. Find the circumcenter of the traingle whose vertices are (-2,3), (2,-1), (4,0)
- 19. Show that the area of the traingle formed by the lines ax2+2hxy+by2=0 and lx+my+n=0 is

$$\frac{n^2\sqrt{h^2-ab}}{\left|am^2-2h/m+bl^2\right|}$$

- 20. Find the values of K, if the lines joining the origin to the points of intersection of the curve $2x^2-2xy+3y^2+2x-y-1=0$ and the line x+2y=k are mutually perpendicular.
- 21. Find the angle between the lines whose d.c's are related by I+m+n=0 & I²+m²+n²=0
- 22. Find the $\frac{dy}{dx}$ of y=(sinx)^{logx}+x^{sinx}
- 23. Find the angle between the curves xy=2 and $x^2+4y=0$
- 24. A wire of length I is cut into two parts which are bent respectively in the form of a square and a circle. what are the lengths of pieces of wire so that the sum of areas is least?
