## Aimstutorial Model Guess Paper-6

## MATHS - 1B <br> (Board of Intermediate Education Model Paper)

## SECTION - A

I. Answer ALL the following Very Short Answer Questions:

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 $2 x-y+z=6$ and $x+y+2 x=7$
5. Evaluate $\underset{x \rightarrow 0}{\operatorname{Lt}} \frac{\mathrm{e}^{7 x}-1}{x}$
6. Compute $\underset{x \rightarrow \infty}{\operatorname{Lt}} \frac{x^{2}+5 x+2}{2 x^{2}-5 x+1}$
7. Find the derivative of $5 \sin x+e^{x} \log x$
8. Find the derivative of $\sec -1\left(\frac{1}{2 \mathrm{x}^{2}-1}\right),\left(0<x<\frac{1}{\sqrt{2}}\right)$
9. Find $\Delta y$ and dy of the function $y=x^{2}+x$, for the values $x=10$ and $\Delta x=0.1$.
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:
11. $A(1,2), B(2,-3)$ and $c(-2,3)$ are three points. A point $P$ moves such that: $P A^{2}+P B^{2}=2 P C^{2}$. show that the equation to the locus of $P$ is $7 x-7 y+4=0$
12. When the axes are rotated through an angle $\pi / 4$, Find the transformed equation of $3 x^{2}+10 x y+3 y^{2}=9$
13. Find the value of $P$, if the lines $3 x+4 y=5,2 x+3 y=4, p x+4 y=6$ are concurrent
14. Check the continuity of the following function at 2. $f(x)=f(x)=\left\{\begin{array}{lll}\frac{1}{2}\left(x^{2}-4\right) & \text { if } & 0<x<2 \\ 0 & \text { if } & x=2 \\ 2-8 x^{-3} & \text { if } & x>2\end{array}\right.$
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 $s=f(t)=8 t+t^{3}$. find (i) the velocity at time $t=2$ sec (ii) The initial velocity (iii) acceleration at $\mathrm{t}=2 \mathrm{sec}$.
17. Find the equations of the tangent and normal to the curve $x y=10$ at $(2,5)$

## 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. Show that the area of the traingle formed by the lines $a x^{2}+2 h x y+b y^{2}=0$ and $I x+m y+n=0$ is $\frac{n^{2} \sqrt{h^{2}-a b}}{\left|a m^{2}-2 h / m+b\right|^{2} \mid}$
20. Find the values of $K$, if the lines joining the origin to the points of intersection of the curve $2 x^{2}-2 x y+3 y^{2}+2 x-y-1=0$ and the line $x+2 y=k$ are mutually perpendicular.
21. Find the angle between the lines whose d.c's are related by $I+m+n=0 \& I^{2}+m^{2}+n^{2}=0$
22. Find the $\frac{d y}{d x}$ of $y=(\sin x)^{\log x}+x^{\sin x}$
23. Find the angle between the curves $x y=2$ and $x^{2}+4 y=0$
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?

