Aimstutorial model Guess paper-5

MATHS - 1B

(Board of Intermediate Education Model Paper)

SECTION - A

I. Answer ALL the following Very Short Answer Questions: [10 x 2 = 20]

1. Find the value of x, if the slope of the line apssing through (2,5) and /(x,3) is 2.
2. Find the length of the perpendicular from the point (-2,-3) to the straight line 5x-2y+4=0
3. Find the centroid of the tetrahedron whose vertices are (2,3-4)(-3,3,-2), (-1,4,2),(3,5,1)
4. Find the direction cosines of the normal to the plane x+2y+2z-4=0
5. Compute $\lim_{x\to 0} \frac{e^x - \sin x - 1}{x}$
6. Is the function f is defined by f(x) = $\begin{cases} \frac{\sin 2x}{x} & \text{if } x \neq 0 \\ 1 & \text{if } x \neq 0 \end{cases}$ continuous at 0?
7. Find $\frac{d}{dx}(\sec\sqrt{\tan x})$
8. If $y=\sin^{-1}(\cos x)$, then find $\frac{dy}{dx}$
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 Rolle's theorem for the function $f(x)=x(x+3)e^{-x/2}$ on [-3,0]

SECTION - B

II. Answer any FIVE of the following Short Answer Questions: [5 x 4 = 20]

11. Find the equation of locus of a point P, if A=(2,3), B=(2,-3) and PA+PB=8
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 equation of the line perpendicular to the line 3x+4y+6=0 and making an intercepts -4 on the x-axis.
14. Compute $\lim_{x\to a}\left(\frac{x\sin a - a\sin x}{x-a}\right)$
15. If y = acos(sinx)+bsin(sinx) then prove that :y'+(tanx)y'+ycos^{2}x=0
16. Show that the curves 6x2-5x+2y=0 and 4x2+8y2=3 touch each other at (1/2, 1/2)
17. The volume of a cube is increasing when the length of the edge is 10 centimeters?

SECTION - C

III. Answer any FIVE of the following Long Answer Questions. : [5 x 7 = 35]

18. Find the circumcentre of the traingle whose vertices are (1,3),(0,-2),(-3,1)
19. Show that the area of the traingle formed by the lines $ax^2+2hxy+by^2=0$ and $lx+my+n=0$ is $\frac{n^2\sqrt{h^2-ab}}{\left|am^2-2h/m+bl^2\right|}$
20. Find the equation of the pair of straight lines joining the origin to the points of intersection of the line : 6x-y+8=0 with the pair of straight lines $3x^2+4xy-4y^2-11x+2y+6=0$ and show that the lines obtained make equal angles with the coordinate axes.
21. If a ray makes angle $\alpha,\beta,\gamma,\delta$ with the four diagonals of a cube then show that $\cos^2\alpha+\cos^2\beta+\cos^2\gamma+\cos^2\delta$
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. Find the lengths of subtangent, subnormal at a point t on the curve y=a(cost+tsint), x=a(sin t - tcost).
24. The profits function p(x) of a company, selling x items per day is given by p(x)=(150-x)x-1600. find the number of items that the comapny should sell to get maximum profit. Also find the maximum profit.

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