STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
(For Candidates admitted during the academic year 2019 – 2020 & thereafter)
SUBJECT CODE: 19EC/AC/MM25
B.A. DEGREE EXAMINATION APRIL 2023
BRANCH IV - ECONOMICS
SECOND SEMESTER

COURSE : ALLIED - CORE
PAPER : MATHEMATICAL METHODS FOR ECONOMICS
TIME : 3 HOURS **MAX.MARKS: 100**

SECTION A

ANSWER ANY TEN QUESTIONS.

(10 X 2 = 20)

1.Find the slope of the curve $2x = -4y+5$

2. Find the equation of the hyperbola whose centre is (6,2) and focus is (4,2) e=2.

3. If $A=\begin{pmatrix} 2 & 1 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$ Find [A |

4. Find AB and BA, if $A=\begin{pmatrix} 4 & 6 & 2 \\ 1 & 2 & 4 \\ 3 & 9 & 2 \end{pmatrix}$ and $B=\begin{pmatrix} 8 \\ 7 \\ 1 \end{pmatrix}$

5. What is logarithmic function?

6. If $Z=15y^2$ and $Y=2x^2$, Find dz/dx.

7. Write down the derivation of Margi al cost function.

8. Find out the elasticity of demand for the following functions:

i) $P= x e^{x}$ ii) $P= xe^{-x}$

9. Find the Maximum and Minimum values of the function $Y=x^2-6x+13$

10. The cost C of manufacturing a certain article is given by formula $C= 5+48/x+3x^2$ where x is the number of article manufactured. Find Minimum value of C.

11. Find the partial derivatives of $Z=4x^2+4xy+y^2$

12. Given $Z=x^2-2x+2y^2$, Find $(\partial z/\partial x)$ and $(\partial z/\partial y)$

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SECTION B

ANSWER ANY FIVE QUESTIONS. **(5 X 8= 40)**

13. Given the price line 2x+3y=20. Find the slope and y-Intercept.

14. Find inverse of the matrix

$$\begin{bmatrix} 1 & 1 & -4 \\ -1 & -2 & 1 \\ 2 & 4 & -5 \end{bmatrix}$$

15. If U= $X^3+Y^3+Z^3-3XYZ$, Prove that $X(\partial u/\partial x) + Y(\partial u/\partial y) + Z(\partial u/\partial z)=3U$

16. Write down the rules of differentiation.

17. Examine the properties of determinants.

18. The total profit Y (in rupees) of a company from the manufacture and sale of x bottles is given by $y= - x^2/400+2x-80$:

    i) How many bottles must the company sell to achieve maximum profit?

    ii) What is the profit per bottle when this maximum is achieved?

19. For the supply function $x=5+2p^2$. Find the elasticity of the supply at p=2.

20. Show that $f(x,y,z) = (x/z) +(y/z)$ is homogenous function in x, y, z of zero degree.

SECTION C

ANSWER ANY TWO QUESTIONS. **(2X 20 = 40)**

21. Find the equation of the Straight line , If y intercept is -7 and slope is ¾ .

22. Solve the following set of Linear equation simultaneous equations:

    $2x_1+3x_2 =5$ (1)

    $11x_1-5x_2 =6$ (2)

23. The total cost C(x) associated with producing and marketing X units of an item is given by $C(x)= 0.005x^3-0.02x^2-30x+3000$. Find

    (i) Total cost when output is 4 units
    (ii) Average cost of output of 10 Units.
    (iii) Marginal cost when the output is 3 Units.

24. Find the maximum and minimum values of $2x^3-3x^2-36x+10$

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