# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.A.** DEGREE EXAMINATION – **ECONOMICS**

THIRD SEMESTER – **APRIL 2022**

## UEC 3501 – MATHEMATICAL METHODS FOR ECONOMICS

(2021 BATCH ONLY)

Date: 22-06-2022     Dept. No.                    Max. : 100 Marks
Time: 09:00 AM - 12:00 NOON

## PART A

**Answer any FIVE questions in about 75 words each.**                    **(5 × 4 = 20 marks)**

1. What is meant by linear function? Give an example.

2. Find the determinant of the following matrix $A = \begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$

3. Give the meaning of (a) square matrix (b) Null matrix.

4. If $y = (2x^3 + 9)(x^2 + 3x)$ find $\frac{dy}{dx}$.

5. Compute Average cost and Marginal cost for the Total cost function.

   $C = 8x^3 + 3x^2 - 6x + 3$.

6. If $y = 5x^4 + 2x^3$, find $dy/dx$, $d^2y/dx^2$.

7. Distinguish between a definite integral and indefinite integral.

## PART B

**Answer any FOUR questions in about 250 words each.**                    **(4 × 10 = 40 marks)**

8. What is the equilibrium price and quantity, given the following demand and supply equations?

   $Q_s = -4 + 2p$

   $Q_d = 66 - 3p$

9. Find the inverse of the following matrix.

   $B = \begin{bmatrix} 5 & 3 \\ 6 & 1 \end{bmatrix}$

10. State the various rules of differentiation.

11. Evaluate $dy/dx$ for $y = x + 1/x - 1$.

12. Find the Maxima or Minima of the function: $y = 2x^2 - 6x$.

13. Find the first and second order partial derivatives for $Z = x^2 + 5xy + 2y^2$

14. Integrate the following.

    (a) $\int (5x^2 - 8x + 5)dx$

    (b) $\int (X^{2/3} + 2X + 3)dx$

## PART C

**Answer any TWO questions in about 900 words each.**                    **(2 × 20 = 40 marks)**

15. Explain the various types of functions and the procedure for solving the functions.

16. Solve the following equations using Cramer's Rule.

$$2X + 3Y = 13$$
$$X + 7Y = 23$$

17. Find the elasticity of demand and MR at P = 2, if the demand function is given by

$$Q = 30 - 5P + P^2$$

18. The demand and supply function of a commodity are $P_d = 18 - 2x - x^2$ and

$P_s = 2x - 3$. Find the consumer's surplus and producer's surplus at equilibrium price.

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