LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034 **B.A.** DEGREE EXAMINATION – **ECONOMICS** FIRST SEMESTER - APRIL 2022 16/17/18UEC1MC02 – MATHEMATICS FOR ECONOMICS Date: 23-06-2022 Dept. No. Max.: 100 Marks Time: 09:00 AM - 12:00 NOON PART-A Answer any FIVE questions (5x4=20)1. State the first and second order conditions for maxima and minima of a function. 2. Find the value of x for 4x + 3 = 2x + 5. 3. If Total Revenue $R = 20Q - 3Q^2$, find average and marginal revenues. 4. Evaluate $\int (x^3 + 4x^2 + 3) dx$ 5. What is point of inflection? 6. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}$, prove that A + B = B + A. 7. What is x intercept? What is the procedure for deriving it? **PART-B** (4x10=40) **Answer any FOUR questions** 8. Find the inverse of A = $\begin{bmatrix} 5 & 1 & 1 \\ 0 & 2 & 2 \end{bmatrix}$ 9. Solve the following quadratic equation: $x^2 + 9x + 14 = 0$ 10. Solve using simultaneous equations method: 4x - 2y = 45x + 3y = 1611. Examine the function $Z = 8x^3 + 2xy - 3x^2 + y^2 + 1$ for maximum and minimum values. 12. State the properties of determinants. 13. Prove that the rate of fall of MR curve is twice the rate of fall of AR curve. 14. Solve: 8x + 5(x + 7) + 9(2x + 23) - 3(x + 6) = 0PART-C Answer any TWO questions (2x20=40)15. Solve the following set of equations by Cramer's Rule 2x - 3y + 4z = 83x + 4y - 5z = -44x - 5y + 6z = -1216. Find the equilibrium quantity and price given the demand function $P_{D} = 10 - 3Q$ and the supply function $P_{s} = 2Q$.

- Also plot the demand and supply curves in a graph sheet and verify the answer graphically.
- 17. Discuss the application of derivatives and partial derivatives in economics.
- 18. Derive the relationship between AC and MC mathematically using derivatives.

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