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21UEO408

(FOR THE CANDIDATES ADMITTED

DURING THE ACADEMIC YEAR 2021 ONLY)

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY - 2023

COURSE NAME: B.A.-ECONOMICS **MAXIMUM MARKS: 70**

SEMESTER: IV **TIME : 3 HOURS**

PART - III

MATHEMATICAL METHODS

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.MULTIPLE CHOICE QUESTIONS. (K1)

1. Abstraction from reality is made and this is based on _____.
   (a) Assumptions (b) Predication (c) Theory (d) Hypothesis

2. The matrix $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is a _____.
   (a) Identity matrix (b) Symmetric Matrix
   (c) Skew Symmetric Matrix (d) None of these

3. The given function f (x) = $ax^2 + bx + c$, is an example of _____ function:
   (a) Quadratic (b) Polynomial (c) Linear (d) Rational

4. Differentiation of constant term gives_____.
   (a) Infinity (b) One (c) Zero (d) Non-Infinity

5. Formula for calculating Marginal Cost_____.
   (a) MC = d (TC) / dQ (b) MC = dQ / d (TR) (c) Qd = Qs (d) Ps = 2Q + 1

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. What is Mathematical Economics?
7. State the Unit Matrix.
8. Solve for x quantity demanded if 16x - 4 = 68 + 7x
9. Find the total differential of $u = 4x^2 + 3y^2$
10. What is producer surplus?

SECTION – B (5 X 4 = 20 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Sketch the different functions of Mathematical economics.

(OR)

b) Solve the Quadratic Equation $3x^2 + 7x + 2 = 0$ by the standard formula method.

(CONTD….2)

12. a) State the properties of matrix multiplication.

(OR)

b) Verify that $B^T A^T = (AB)^T$ when $A = \begin{matrix} 1 & 1 & 2 \\ 2 & 1 & 0 \end{matrix}$, $B = \begin{matrix} 1 & 2 \\ 2 & 0 \\ -1 & 1 \end{matrix}$

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13. a) Given the total cost function. TC=30 $+6Q^2+14Q^3$ drive the marginal cost function.

(OR)

b) Find the maxima or minima of the function $y = x^2 - 4x - 5$.

14. a) Compute Marginal Utilities of x and y for the following utility functions.
(i) $U = 5xy - y^2$
(ii) $U = x^2 - y^2 - 2x^2y$

(OR)

b) Compute marginal utilities of x and y for the Total utility function.
U= (x+3y) (3y-3x)

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15. a) Explain Consumer Surplus with help of diagram.

(OR)

b) Evaluate the following integrals.

$$\frac{12}{(4x-5)^3} + \frac{6}{3x+2} + 16e^{4x+3}$$

SECTION - C **(4 X 10 = 40 MARKS)**

ANSWER ANY FOUR OUT OF SIX QUESTIONS
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS
(FROM Qn. No : 17 to 21) **(K4 (Or) K5)**

16. Examine the different kinds of Matrices.

17. Elucidate the role of mathematics in economics.

18. Solve
$4x + 3y - z = 2$
$x - 2y + 5z = 3$
$3x + 4y + 2z = 6$

19. Investigate the maximum or minimum value of the following function.
$Z = 10x + 20y - x^2 - y^2$

20. A producer has the total cost function $TC(Q) = Q^3 - 18Q^2 + 91Q + 10$ where costs are given in rupees. Find the Marginal cost and the Average Variable Cost, when Q = 3.

21. If the demand function is P = 35 – 2x – x2 and the demand x0 is 3, what will be the consumer surplus?.

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