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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2024-2025 ONLY) **23UE0408**

REG.NO.

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

END-OF-SEMESTER EXAMINATIONS : MAY-2025

BA ECONOMICS **MAXIMUM MARKS: 75**

SEMESTER- IV **TIME : 3 HOURS**

PART - III

23UEO408 MATHEMATICAL METHODS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.(K1)

1. What is the primary role of mathematical tools in economic analysis?

a) To simplify complex economic concepts

b) To provide a framework for data analysis

c) To facilitate forecasting and prediction

d) To prove economic theories

2. What is the order of a matrix with 3 rows and 4 columns?

a) 3 x 3 b) 3 x 4 c) 4 x 3 d) 4 x 4

3. What is the derivative of x^3?

a) 2x^2 b) 3x^2 c) 4x^3 d) 5x^4

4. If f(x,y) = x^2y + xy^2, what is ∂f/∂x?

a) 2xy + y^2 b) 2xy - y^2 c) x^2 + 2xy d) x^2 - 2xy

5. What is the integral of 2x + 1 with respect to x?

a) x^2 + x + C b) x^2 - x + C c) x^2 + 2x + C d) x^2 - 2x + C

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

6. Define Simultaneous Equations

7. What is Transpose of a Matrix?

8 Define Maxima and Minima

9. What is Higher Order Derivatives?

10. Define Consumer's surplus

SECTION – B (5 X 5 = 25 MARKS)

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

11. a) What are the advantages of Quadratic Equations?

(OR)

b) Solve the following simultaneous equations:

$$2x + 3y = 7$$
$$x - 2y = -3$$

12. a) Write about any five types of matrices.

(OR)

b) To find the adjoint matrix the following 3x3 matrix:

1	2	3
4	5	6
7	8	9

13. a) Explain the Rules of Differentiation

(OR)

b) State the Types of Maxima and Minima:

14. a) Find the total differential of $z = (x^2+y)(2x-y^2)$

(OR)

b) Explain the Types of Marginal Functions:

15. a) Differentiate the Definite and Indefinite Integrals

(OR)

b) Market Price: Rs 3 per unit
Minimum Acceptable Price: Rs 2 per unit
Quantity Sold: 100 units. Find out producers surplus

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4/K5)

16. a) State the importance of Linear Equations

(OR)

b) Explain Linear Equations Methods with suitable example

17. a) Find the ad-joint of the matrix:

$$A = \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$$

(OR)

b) Solve the system of equations:

$$2x + 3y = 7$$
$$x - 2y = -3$$

Using Cramer's Rule:

18. a) The profit function is given by P(x) = 2x^2 - 12x + 20, where x is the price. find the price that maximizes the profit. Using derivatives,

(OR)

b) 'Differentiation Applications in Economics' Discuss

19. a) State the Applications of Higher-Order Partial Derivatives in Economics.

(OR)

b) Find the maxima and minima of the following functions:
f(x, y) = x^2 + y^2 - 2x - 4y + 5

20. a) Find the value of $\int 2x \cos(x^2 - 5)$

(OR)

b) Describes consumer's surplus and producer's surplus.