

(FOR THE CANDIDATES ADMITTED

24UEO408

DURING THE ACADEMIC YEAR 2024-2025 ONLY)

REG.NO. :

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

END-OF-SEMESTER EXAMINATIONS: APRIL 2026

BA ECONOMICS

MAXIMUM MARKS: 75

SEMESTER IV

TIME: 3 HOURS

PART - III

MATHEMATICAL METHODS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. Mathematical economics mainly helps economists to _____
 - a. Write economic history
 - b. Present economic ideas clearly using symbol
 - c. Avoid economic theories
 - d. Replace economics with mathematics
2. Differentiation in mathematics mainly deals with _____
 - a. Total change in variables
 - b. Rate of change of one variable with respect to another
 - c. Average change only
 - d. Constant values
3. The first derivative of a function represents _____
 - a. Total Value
 - b. Average Value
 - c. Marginal Value
 - d. Constant Value
4. Partial differentiation is used when a function depends on _____
 - a. One variable only
 - b. Two or More independent variables
 - c. Constants Only
 - d. No Variables
5. Integration is the reverse process of _____
 - a. Differentiation
 - b. Multiplication
 - c. Division
 - d. Substitution

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

6. Explain how Quadratic equations in economics are often used to analyse:
7. A matrix having equal number of rows and columns is called:
8. What is the nature of a function when the second derivative at a point is positive?
9. Explain the second-order condition required for a maximum value of z.
10. Explain where the constant of integration (C) appears and state its significance.

SECTION – B (5 X 5 = 25 MARKS)

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

11. a) Solve the following simultaneous equations.
$$14x - 82y = 9 \dots (1)$$
$$91x - 15y = 31 \dots (2)$$

(OR)

- b) Highlight the importance of economic theories in Mathematics.
 12. a) Describe the types of Matrix
- (OR)**
- b) Analyse the determinant of the following Matric

$$D = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 5 & 6 \\ 4 & 5 & 3 \end{bmatrix}$$

13. a) Summarize the marginal analysis in Differential Calculus

(OR)

- b) Illustrate the dy/dx of the following

$$y = (1 - \sqrt{x})(1 + \sqrt{x})$$

14. a) Simplify the partial derivatives of

$$Z = (x+4)(2x+5y)$$

(OR)

- b) Calculate the mixed partial derivatives of the function $Z = 4x^2 + 4xy + y^2$

15. a) Apply the Integral rule on the following functions:

I. $x\sqrt[3]{x-2}$

II. $\frac{x^2}{x+2}$

(OR)

- b) Solve the Applications of Integral function on

I. $MC = (1+x+6x^2)$, find the TC when FC is 100,

II. $MC = 2+3e^x$ find TC when $C=500$

SECTION – C

(5 X 8 = 40 MARKS)

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

16. a) Examine the following Quadratic Equation: (K4OR K5)

$$x^2 - 5x + 6 = 0$$

(OR)

- b) The supply and demand curves for a commodity are known to be $Q_s = P - 1$ and $Q_d = 12/P$. (Q_s = Quantity supplied, Q_d = Quantity demanded) find the equilibrium price

17. a) Analyze the x, y and z from the following set of equations using Cramer's Rule

$$x + 2y + 3z = 9$$

$$2x + 3y + z = 8$$

$$3x + y + 2z = 10$$

(OR)

- b) Show that $A(B+C) = AB+AC$

$$A = \begin{bmatrix} 3 & 0 & 2 \\ 4 & 5 & 6 \\ 7 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 0 & 2 \\ 7 & 8 & 5 \\ 5 & 3 & 4 \end{bmatrix} \quad C = \begin{bmatrix} 9 & 5 & 6 \\ 7 & 2 & 4 \\ 1 & 6 & 0 \end{bmatrix}$$

18. a) Find the maximum and minimum values of the function $y = 3x^4 - 10x^3 + 6x^2 + 5$.

(OR)

- b) Find $\frac{dy}{dx}$, if $y = \frac{4x^2 - 7x^2 - 8}{4x + 3}$

19. a) Examine the second order partial derivative of a function: $3x^3 + 5x^2y + 7y^2$

(OR)

- b) Estimate the second order partial derivative of a function: $Z = \frac{x+4}{2x+5y}$

20. a) Evaluate the following: $\int (3x^2 + 4x + 5)dx$

(OR)

- b) Examine the following function of

$$\int_1^3 (2x + 1)dx$$
