M. A. DEGREE END SEMESTER EXAMINATION - NOVEMBER 2025

SEMESTER 1 : ECONOMICS

COURSE : **24P1ECOT05 : QUANTITATIVE TOOLS FOR ECONOMIC ANALYSIS**

(For Regular - 2025 Admission and Improvement / Supplementary 2024 Admission)

Time : Three Hours

Max. Weights: 30

(Use of Scientific calculator and statistical tables are permitted)

PART A

Answer any 8 questions   **Weight: 1**

1. What is Lagrange's multiplier method?   (R)
2. Give two applications of inegration in Economics.   (R)
3. Define first and second order partial derivatives   (R)
4. Define inverse of a matrix and its properties?   (R)
5. Distinguish between singular and non singular matrix   (R)
6. Find $\int \frac{1}{9x-5}dx$ (A)
7. Mention the objectives of input output analysis.   (R)
8. What are slack and surplus variable?   (R)
9. Distinguish upper and lower triangular matrix with example.   (R)
10. What is Cobb-Douglas production function   (R)

(1 x 8 = 8)

PART B

Answer any 6 questions   **Weights: 2**

11. Find the inverse of the matrix $\begin{bmatrix} 4 & 6 & 3 \\ 8 & 2 & -4 \\ 7 & 4 & 5 \end{bmatrix}$ (A)

12. If the supply function of a product is $p = 1 + \frac{x^2}{4}$, evaluate the producer's surplus, when the supply is 6 units.   (A)

13. Verify Euler's theorem for the function, $Z=2x^2+3y^2+5xy$ (A)

14. Find the partial elasticity of cost for the function $C = x_1^2 + 2x_1x_2 \text{ when } x_1 = 1 \text{ and } x_2 = 2$ (A)

15. Explain how will you formulate a mathematical model to a given linear prgramming problem   (U)

16. Integrate (1) x^2e^{2x} (2) $x^{2/3}dx$ (A)

17. Explain the linear programming techniques   (R)

18. Explain the terms a) Transpose of a matrix b) symmetric matrix c) minors and cofactros   (U)

(2 x 6 = 12)

PART C

Answer any 2 questions   **Weights: 5**

19. The marginal revenue function is given by MR= $3(x+1)^2+3$. Find the total revenue function and hence the demand function   (A)

20. (a) Define (1) Marginal cost (2) Total cost and (3) Average cost
(b) Find an expression for the MC function given the following average cost functions $\left(a\right) AC = 2Q + 5 + \frac{30}{Q}$ $\left(b\right) AC = 3Q^2 - 4Q + 6 + \frac{100}{Q}$ in each case calculate the value of marginal cost when Q=50   (An)

21. Solve the system of equations using Matrix inversion method
x+ 2y + 3z =14, x +y +z = 6, -x + y - z =-2   (A)

22. Using simmplex method solve the following LPP
$Maximise \ Z = 20X + 25Y \ subject \ to \ 3X + 4Y \le 25, \ 4X + 2Y \le 20, \ X > 0 \ and \ Y > 0$ (A)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;