M. A. DEGREE END SEMESTER EXAMINATION : NOVEMBER 2023
SEMESTER 1 : ECONOMICS
COURSE : **21P1ECOT05 : QUANTITATIVE TOOLS FOR ECONOMIC ANALYSIS**
(For Regular - 2023 Admission and Improvement/Supplementary -2022/2021 Admissions)
(Use of Scientific calculator and statistical tables are permitted)

Duration : Three Hours   Max. Weights: 30

PART A
Answer any 8 questions   **Weight: 1**

1. What are the important laws of matrix addition? Give examples.   (R)
2. Explain (1) Marginal utility (2) marginal productivity   (R)
3. What do you mean by consistent system of equations?   (R, CO 2)
4. Define basic feasible solution   (R, CO 4)
5. Distinguish upper and lower triangular matrix with example   (R)
6. Find $\int \frac{1}{3x} dx$ (A)
7. Define elasticity of demand   (R, CO 2)
8. What is optimization in L.P.P.   (R, CO 4)
9. Find $\int \frac{1}{9x-5} dx$ (A)
10. Define (i) Diagonal matrix (ii) Singular
    matrix.   (R, CO 1)

                                                                        (1 x 8 = 8)

PART B
Answer any 6 questions   **Weights: 2**

11. Integrate the following (i) $x(x^2+1)^3$ (ii) $x^2 e^x$ (A)

12. The demand function for a good is given as P=50-2Q. (1) write down the expression for TR   (A, CO 2)
    and MR functions. Also calculate the output at which TR is a maximum

13. Explain briefly input/output models and their uses?   (R)
14. Define consumer's surplus and producer's surplus   (R)
15. $If\ A = \begin{bmatrix} -4 & 1 & 3 \\ 2 & 5 & -1 \\ 6 & 9 & 3 \end{bmatrix} and\ B = \begin{bmatrix} -4 & 2 & 7 \\ -2 & 1 & 5 \\ 3 & 2 & 4 \end{bmatrix} then\ verify\ whether\ AB = BA$ (A)

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

17. What do you mean by the dual of a linear programming problem? Explain the dual
    advantages.   (R)

18. Differentiate the following
    $(a)\ y = x^2 e^x$ $(b)\ P = \frac{Q}{3Q+5}$ (A)

                                                                        (2 x 6 = 12)

PART C
Answer any 2 questions   **Weights: 5**

19. Solve the following LP problem by the simplex method
    Maximise Z=3X+2Y subject to X+Y≤4, X-Y≤2; X,Y>0   (A, CO 4)

20. Solve the following system of equations using matrix inverse method
    4X+Y+2Z = 7
    7X - Y+Z = 7   (A)
    3X+4Y+Z = 8

21. The demand and supply function for a good
    are $P = 100 - 0.5Q \ and \ P = 10 + 0.5Q$ respectively Calculate consumer   (A)
    and producer surplus at equilibrium

22. Verify Euler's theorem for the following Z=x^2+xy+y^2 (A)
                                                                        (5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1		E	10	1
CO 2		A	3, 7, 12	4
CO 4		A	4, 8, 19	7

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