

M. A DEGREE END SEMESTER EXAMINATION : OCTOBER 2022**SEMESTER 1 : ECONOMICS****COURSE : 21P1ECOT05: QUANTITATIVE TOOLS FOR ECONOMIC ANALYSIS***(For Regular - 2022 Admission and Supplementary - 2021 Admission)*

Duration : Three Hours

Max. Weights: 30

(Use of Scientific Calculator and Statistical tables are permitted)**PART A****Answer any 8 questions****Weight: 1**

1. Define non singular matrix and give an example of it (R)
2. Define a) singular matrix b) upper and lower triangular matrices. (R)
3. What do you mean by consistent system of equation? (R)
4. Give any two applications of differentiation (R, CO 2)
5. Define consumer surplus (R, CO 2)
6. What is Cobb-Douglas production function (R, CO 2)
7. Give two applications of integration in Economics. (R, CO 3)
8. Define the integral of a function (R, CO 3)
9. Write the dual of the following LP problem Maximise
 $z = 4x_1 + 2x_2$, subject to (A)
 $-x_1 - x_2 < -3, -x_1 + x_2 > -2, x_1, x_2 > 0$
10. What is the objective function in a linear programming problem? (R, CO 4)

(1 x 8 = 8)**PART B****Answer any 6 questions****Weights: 2**

11. Find the determinant of the matrices $A = \begin{bmatrix} 1 & 0 & 1 \\ 2 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 & 4 \\ 1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix}$ and (A)
 show that $|AB| = |A| |B|$
12. 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)
13. A firm's demand function is given by the equation $P = \frac{150}{e^{0.02Q}}$. Write down the equations (A,
 for Total Revenue and Marginal revenue. CO
 2)
14. The utility function of a consumer is given by $f(x, y) = 2x^3y + 3xy^2$ find the marginal (A)
 utilities and also show that $f_{xy} = f_{yx}$
15. Integrate the following functions (i) $\frac{x^4}{(2+3x^5)^6}$ (2) $x \log x$ (A)
16. Explain Simpson's one-third rule (R,
 CO
 3)

17. Explain the linear programming techniques (R, CO 4)
18. Explain the steps for solving an LPP using graphical method. (R)
(2 x 6 = 12)

PART C
Answer any 2 questions

Weights: 5

19. Solve by Cramer's rule
 $5x-6y+4z = 15$
 $7x+4y-3z = 19$
 $2x+ y+6z = 46$ (A)
20. Explain various applications of partial derivatives in economics (U, CO 2)
21. The demand and supply function for a good are $P = 50 - 2Q$ and $P = 14 + 4Q$ Calculate the consumer surplus and producers surplus at equilibrium (A)
22. Solve the following LP problem by the simple method
 Maximise $Z=3X+2Y$ subject to $X+Y \leq 4$, $X-Y \leq 2$; $X, Y > 0$ (A, CO 4)
 (5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 2		A	4, 5, 6, 13, 20	10
CO 3		An	7, 8, 16	4
CO 4		A	10, 17, 22	8

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