

M.A. DEGREE END SEMESTER EXAMINATION NOVEMBER 2017**SEMESTER –1: ECONOMICS****COURSE: 16P1ECOT05: QUANTITATIVE TOOLS FOR ECONOMIC ANALYSIS***(Common for Regular 2017 admission and Supplementary 2016 admission)*

Time: Three Hours

Max. Marks: 75

PART AAnswer **any eight** questions. Each question carries **2** marks

1. Define i) scalar matrix ii) symmetric matrices
2. Define adjoint and inverse of a matrix.
3. Define rank of a matrix.
4. Write two properties of determinant.
5. State Euler's theorem and point out its applicability in economics.
6. What are the conditions for a function $f(x,y)$ to be a minimum?
7. What do you mean by integration?
8. Define definite integral.
9. Explain consumer's surplus.
10. Write at least two applications of integration.
11. Define linear programming problem.
12. Define feasible and optimal solutions of a Linear Programming problem.

(2 x 8 = 16)

PART BAnswer **any seven** questions. Each question carries **5** marks

13. Find the rank of the matrix $\begin{bmatrix} 5 & 7 & 2 \\ 2 & 3 & 1 \\ 4 & 6 & 2 \end{bmatrix}$

14. Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 2 & 4 & 3 \end{bmatrix}$

15. Explain about the homogeneous functions with example.
16. Find the total differential of the function $u = (x^2 + y^2)(2x^2 - y)$
17. Find the partial elasticity for the function $x = 10 - 2p_1 - 3p_2$
18. Find the partial derivative of the second order of i) $u = x^2 - x y^2$ ii) $u = \log(3x + y)$
19. Integrate the following functions
 - i) $3e^{2x} + \frac{5}{x}$
 - ii) $x(x^2 + 1)^{3/2}$
20. Explain Simpson's one third rule.
21. Given the marginal cost function for a certain product is $5 + x^2$. Find the total cost and average cost functions if the fixed cost is 50.
22. Explain input /output analysis.

(5 x 7 = 35)

PART C

Answer **any two** questions. Each question carries **12** marks

23. Solve by cramer's rule

$$x + 6y - z = 10$$

$$2x + 3y + 3z = 17$$

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

24. Explain some applications of partial derivatives in Economics for the production function

$$x = K^3 - 8k^2 + 10KL + 5KL^2 - 3L^3, \text{ find Marginal products of labour and Capital at } L = 2, K = 3.$$

25. If $u = x^2 - y^2 + xy + 5x$, find the extreme value of the function subject to $x + y = 3$ using Lagrange's multiplier method.

26. Using simplex method, solve the following LPP

$$\text{Maximize } z = 6x + 9y \text{ subject to } 7x + 12y \leq 120, 10x + 8y \leq 120, x, y \geq 0$$

(12 x 2 = 24)
