Reg. No.. Name.. **19P1056**

M. A. DEGREE END SEMESTER EXAMINATION - OCTOBER 2019

SEMESTER **1: ECONOMICS (CORE COURSE)**

COURSE: **16P1ECOT05 – QUANTITATIVE TOOLS FOR ECONOMIC ANALYSIS**

(For Regular - 2019 Admission and Supplementary 2018 / 2017 / 2016 Admissions)

Time: Three Hours Max Mark: 75

PART - A

Answer any ***eight*** questions. Each question carries **2** marks

1. Define minor of a matrix with the help of an example.
2. What do you mean by rank of a matrix?
3. What do you mean by a inverse of a matrix?
4. Mention the properties of Cobb-Douglas production function.
5. Define marginal elasticity of demand.
6. What are the conditions for a function f(x,y) to be a maximum?
7. How will you obtain the total utility function from the marginal utility function?
8. What is cost function?
9. What is Simpson's one-third rule?
10. How will you obtain an optimum solution of a linear programming using graphical method?
11. When will you consider dual of LPP?
12. Mention the objectives of input/ output analysis. (2 x 8 = 16)

PART - B

Answer any ***Seven*** questions. Each question carries **5**marks

13. If A = $\begin{pmatrix} 1 & 2 \\ 4 & 1 \end{pmatrix}$ and B = $\begin{pmatrix} 2 & 4 \\ 5 & -1 \end{pmatrix}$, then verify whether $A^2 - B^2 = (A-B)(A+B)$.

14. If $\begin{vmatrix} -3 & -6 & 1 \\ 5 & x & -2 \\ 2 & -3 & 5 \end{vmatrix}$ = -7 then find the value of x.

15. Explain the significance of Euler's theorem with the help of an example of a homogeneous production function.
16. The revenue function of a firm is given by $f(x,y) = 4xy + xy^2$. Find the marginal revenue functions and also show that $f_{xy} = f_{yx}$
17. Obtain marginal rate of substitution if the utility function is $U(x,y)=5xy^2-2xy+2y^3$.

18. Maximise the profit if the profit function of a firm is $P(x) = x^2 + xy + 2y^2 - 800$ subject to the Production quota $x + y = 100$
19. Integrate the following functions
    (i) $(x+1)^3$ (ii) $x \log x$
20. Explain trpezoidal rule.
21. Explain how will you formulate a linear programming problem?
22. Describe input/ output (I/O) analysis. (5 x 7 = 35)

PART - C

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

23. Solve the following system of equations using Cramer's rule.

$$3x - y + 2z = 13$$
$$2x + y - z = 3$$
$$x + 3y - 5z = -8$$

24. Explain the various applications of partial derivatives in economics.

25. The total cost of x units is y rupees, where $y=900x-30x^2+x^3$ and all units made are sold at Rs.10 per unit. At what two points does marginal cost equal marginal revenue?

26. A manufacturer makes two types of toys A and B. Three machine are needed for this purpose and the time (in minutes) required for each toy on the machines is given below:

Types of Toys	Machines		
	I	II	III
A	20	10	10
B	10	20	30

The machines I, II and III are available for a maximum of 180 minutes, 120 minutes and 150 minutes respectively. The profit on each toy of type A is Rs 50, and that of type B is Rs 60. Formulate the above problem as a L.P.P and solve it graphically to maximize profit.

(12 x 2 = 24)

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