B.A. DEGREE EXAMINATION,NOVEMBER 2018
III Year V Semester
Core Major- Paper XII
MATHEMATICS FOR ECONOMISTS

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define Symmetric Matrix.
2. Mention any two properties of Determinants.
3. Write down a specimen of Leontief's input output table.
4. State Hawkin - Simon conditions.
5. Bring out Product & Quotient rule of differentiation.
6. What is the slope of the function y = $4\mathbf{x^2}$ when x is 8?
7. Marginal Revenue function is given as 100-8q. Calculate total revenue when q = 10.
8. State the conditions for y = f(x) is maxima.
9. Define Partial derivatives.
10. What is Homogenous production function?
11. Differentiate singular & non-singular matrix.
12. What is Implicit function?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. A = $\begin{bmatrix} \mathbf{4} & \mathbf{7} & \mathbf{3} \\ \mathbf{-1} & \mathbf{2} & \mathbf{0} \end{bmatrix}$ & $\mathbf{B}$= $\begin{bmatrix} \mathbf{5} & \mathbf{8} \\ \mathbf{4} & \mathbf{-2} \\ \mathbf{4} & \mathbf{2} \end{bmatrix}$ Prove that AB $\neq$ BA
14. Explain the components of technological co efficient matrix of open input- output model
15. If the demand function P = 50 - Q, find out the MR, TR at Q = 10
16. Derive the relationship between AR, MR and price elasticity of Demand
17. What are the conditions of minima & maxima for z = f(x,y)
18. Explain the use of Derivatives in Economics
19. Prove that Q = $\mathbf{L^3}$ + 3 L $\mathbf{K^2}$ + $\mathbf{K^3}$ is a homogenous production function

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Use Cramer's rule to solve the system of equation
    $4X + 3Y - 2Z = 7$ $X + Y = 5$ $3X + Z = 4$
21. Explain solution of Leontief's open input - output system for a three sector economy.
22. Prove the properties of Cobb Douglas production function?
23. An organization operates with the production function Q = 820 $\mathbf{K^{.3}\ L^{.2}}$ and can buy inputs K and L at Rs 65 and Rs 40 respectively per unit. If it can sell its output at a fixed price of Rs 12 per unit, what is the relationship between increases in L and total profit? Will a change in K affect the extra profit derived from marginal increases in L?
24. Derive the relationship between Average cost and Marginal cost with an example.

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