Roll.No. | 20UECET5ME1

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.A.Economics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - V
20UECET5ME1 - Mathematics for Economists

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Calculate the multiplication of following matrices.
$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 5 \\ 2 & 3 \\ 1 & 2 \end{bmatrix}$
2. Examine the assumptions and limitations of input–output analysis.
3. Apply the product rule to differentiate y= x^2. e^x
4. Describe the conditions for profit maximization using marginal analysis.
5. Compute the partial derivatives of z=x^2y+y^3
6. Addition of Matrics A and B.
$A = \begin{bmatrix} 4 & 3 & 1 \\ 8 & 4 & 2 \\ 6 & 7 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 3 & 1 & -1 \\ 2 & -2 & 5 \\ 3 & 1 & 2 \end{bmatrix}$
7. Differentiate the following with respect to X. $Q - \left(x - \frac{2}{x}\right)^3$.
8. Justify the condition for maxima in a function of two variables.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Solve the system using Cramer's Rule:
x + y = 5
2x - y = 4

Contd....

10. Apply the Leontief open model to the following input-output matrix and demand vector:
    Given: - Input-Output Matrix A:
    $A = \begin{bmatrix} 0.30 & 0.20 \\ 0.40 & 1 \end{bmatrix}$
    Demand Vector D:
    $D = \begin{bmatrix} 100 \\ 150 \end{bmatrix}$
    calculate the total output vector X.
11. Differentiate the following with respect to x.
    (i) $x^3 + 3logx + 2cosx$
    (ii) $3tanx + 2cosx - e^x + 5$
    (iii) $(ax)^n + \sqrt{2}sinx + 3x^{1/2}$.
12. Analyze the role of marginal revenue and marginal cost in profit maximization.
13. Evaluate the conditions for constrained optimization in multivariate functions.

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