

Roll.No.

22PECCT2006

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.

M.A.Economics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - II

22PECCT2006 - Mathematical Methods for Economics

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

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

1. Explain the concept of partitioned matrices with a suitable example.
2. Illustrate the rules of differentiation for a single-variable function.
3. If the demand function is $Q = 100 - 2P$, calculate the point elasticity of demand when $P = 20$.
4. For the function $f(x, y) = x^2y + 3xy^2$, compute the partial derivatives $\partial f/\partial x$ and $\partial f/\partial y$.
5. Describe the properties of linearly homogeneous functions.
6. Given the input-output matrix below, compute the total output required to satisfy a final demand vector $D = \begin{bmatrix} 100 \\ 150 \end{bmatrix}$ $A = \begin{bmatrix} 0.3 & 0.2 \\ 0.4 & 0.1 \end{bmatrix}$ Use: $X = (I - A)^{-1}D$
7. Interpret the conditions for maximum and minimum values of a function.
8. Examine the concept of constrained Profit Maximisation.

Section C

I - Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Solve the following system of equations using Cramer's Rule:

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

$$x - 2y + 4z = -3$$

$$3x + y + 2z = 4$$

10. Given the function $f(x) = x^4 - 8x^2 + 16$, find the local maximum and minimum values using second-order conditions.
11. Justify the conditions for profit maximization using cost and revenue functions.
12. Diagnose the maximum and minimum values of the function $f(x, y) = 4x^2 + y^2 - 4xy$ using second-order conditions.

II - Compulsory question ($1 \times 10 = 10$ Marks)

13. Explain the elasticity of substitution in a Cobb-Douglas production function.
