

QP CODE: 25050406



Reg No :

Name :

MA DEGREE (CSS) EXAMINATION DECEMBER 2025

First Semester

Core Courses - EC010105 - MATHEMATICAL METHODS FOR ECONOMIC ANALYSIS

M A ECONOMICS, M A BUSINESS ECONOMICS

2019 Admission Onwards

3C9A079E

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Define a symmetric matrix and write a symmetric matrix of order 3.
2. State the conditions for equality of two matrices.
3. Define cofactor of a matrix.
4. Define the limit of a function
5. Define the cross-price elasticity of demand. Write the expression for finding it.
6. Evaluate $\int (2x^2 - 3x + 6)dx$.
7. Find the area under the line $y = 5x + 1$ from $x = 2$ to $x = 3$.
8. Define the order of a difference equation.
9. Define surplus variable.
10. Define shadow price.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Define linear dependence of vectors with suitable example.
12. Explain partial equilibrium market model.
13. Find $\frac{dy}{dx}$ for the function $3x^2 - 6y^2 + 4xy = 10$
14. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ for the function $z = 7x^3 - 6y^3 + 12xy - 17$





15. Define the points of inflection of a curve and describe the method of finding it.
16. If the demand and supply function of a commodity are given as $P = 58 - 0.2Q$ and $P = 4 + 0.1Q$, calculate the equilibrium price and quantity. Also calculate the producer surplus at equilibrium.
17. Derive the difference equation of Cobweb economic model.
18. Write the general form of a Linear programming problem.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. (i) Explain Cramer's rule for solving a system of equations.
(ii) Solve the following system of equations using Cramer's rule

$$\begin{aligned} x + 2y - z &= -5 \\ 2x - y + z &= 6 \\ x - y - 3z &= -3 \end{aligned}$$
20. (i) Define the price elasticity of demand, income elasticity of demand and cross-price elasticity of income.
(ii) The demand function for a commodity A is given by $Q_A = 520 - 20P_A + 0.6Y + 2.9P_B$ where P_A is the price of the commodity A , Y is the consumer income and P_B is the price of another commodity B . Find the price, income and cross-price elasticities of demand at $P_A = 6, Y = 500, P_B = 10$.
21. (i) State the product rule of integration.
(ii) Evaluate (a) $\int (3x + 1)\log(x)dx$ (b) $\int_0^\infty 2xe^x dx$
22. Solve the LPP using graphical method

Maximize $Z = 60x + 40y$
 subject to $x + 2y \leq 2000$
 $x + y \leq 1500$
 $x \geq 0, y \geq 0$.

(2×5=10 weightage)

