2025

(FYUGP)

(2nd Semester)

ECONOMICS

(MAJOR)

Paper : EC2.CC4

(Mathematical Methods for Economics—II)

Full Marks : 75
Pass Marks : 40%

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—1

1. *(a)* Define singular and non-singular matrix. Give example. 4

(b) If

$$A = \begin{bmatrix} 3 & 2 & 0 \\ 4 & 1 & 3 \\ 2 & 2 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 2 & 1 & 2 \\ 4 & 0 & 1 \\ 2 & 2 & 5 \end{bmatrix}$$

Find AB. 5

(c) Solve the following equation system by Cramer's rule :

$$2x+y+3z=15$$
$$x-2y+5z=13$$
$$4x+3y-z=11$$

6

2. What is determinants? Explain the properties of determinants with example. 3+12=15

UNIT—2

3. (a) Find the all second-order partial derivatives of the following function : 8

$$Y=4x_1x_2+x_1^3+2x_2^2$$

(b) A consumer consumes two commodities x_1 and x_2 and the utility function is given by

$$U=x_1^2+3x_1x_2+5x_2$$

Find out marginal utilities of x_1 and x_2. 7

4. (a) Find the extreme value of the following function and determine whether they are maxima or minima : 8

$$Y=5x_1^2+2x_2^2-2x_1x_2-15x_1-6x_2$$

(b) Cobb-Douglas production function is given as $Q=AK^{\alpha}L^{\beta}$, where $\alpha+\beta=1$, and L = labour, K = capital, Q = output and A, α and β are constant. Find marginal productivity of L and K. 7

UNIT—3

5. What is Lagrange multiplier? Find the extreme value of the following function : 3+12=15

$$Y=x_1^2+x_1x_2+\frac{3}{2}x_2^2$$

subject to

$$x_1+2x_2=14$$

6. A monopolist discriminates in prices between two markets I and II and the price equations are given by—

$$P_1=60-4Q_1$$
$$P_2=42-3Q_2$$

where Q_1 and Q_2 are the outputs of markets I and II and $Q=Q_1+Q_2$. The total cost $(TC)=50+12Q$. Find—

(a) profit maximising output and prices;

(b) maximum profit;

(c) elasticity of demand of the markets I and II. 7+3+5=15

UNIT—4

7. Explain the inventory control technique in economics. 15

8. *(a)* In a perfectly competitive market the total revenue (TR) and total cost (TC) of a firm are given by

$$TR = 20Q$$

$$TC = Q^2 + 4Q + 20$$

Find profit maximizing output (Q). 7

(b) A monopolist has the following total revenue and total cost functions :

$$TR = 30q - q^2$$

$$TC = q^3 - 15q^2 + 10q + 100$$

Find—

(i) profit maximizing output (q);

(ii) maximum profit. 8

UNIT—5

9. *(a)* What is differential equation? Explain the economic implications of differential equation. 2+8=10

(b) Solve : $\frac{dy}{dx} + 2xy = 2x$ 5

10. Solve the following difference equations : 5×3=15

(a) $y_t - 2y_{t-1} = 3$ with $y_0 = 2$

(b) $y_{t-1} - y_t = 10$ with $y_0 = 5$

(c) $y_{t+1} - 5y_t = 12$ with $y_0 = 10$

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2025

(FYUGP)

(2nd Semester)

ENGLISH

(MAJOR)

Paper : ENG C–4

(British Poetry and Drama : 14th to 17th Centuries)

Full Marks : 75
Pass Marks : 40%

Time : 3 hours

The questions are of equal value

1. Discuss how Shakespeare was the voice of Renaissance Humanism in sixteenth century England.

Or

Elizabethan poetry strongly reflects the political attitudes and conventions of the Tudor court. Discuss.

2. Critically analyze *Batter My Heart* by John Donne as a metaphysical poem.

Or

How does Donne contrast physical and spiritual love in *A Valediction: Forbidding Mourning*?

3. Analyze Marlowe's Dr. Faustus as a tragic hero.

Or

Discuss Marlowe's play, *Dr. Faustus* as an Elizabethan tragedy.

4. Analyze the theme of loyalty to king and country as presented in *Macbeth*.

Or

"*Macbeth* is a play about crime and punishment." Explain with a reasoned answer.

5. Discuss the play, *Twelfth Night* as a Romantic comedy.

Or

Write a note on the role of Feste, the Clown in the play, *Twelfth Night*.

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