QP CODE

C1024

Enrollment Number: ……

Name: ……

B.A DEGREE EXAMINATIONS, JULY 2025
Fourth Semester
B.A Economics
B21EC01DE – Mathematical Economics
(2023 January admissions)

Time: 3 Hours **Max Marks: 70**

Section A

Answer any ten of the following questions in a word or sentence each. Each question carries 1 mark.

1. If P = 10, at the point on the demand curve where $e = 0.5$, what is the value of MR?
2. Describe Iso-quant.
3. What is a production function?
4. Define Mathematical economics.
5. What is Optimization?
6. What is cross price elasticity?
7. Describe MRTS.
8. Define point of inflection.
9. What is the general form of a linear function?
10. How do we find the profit?
11. What shape do indifference curves take for normal goods?
12. What are economic models?
13. If a production function is homogenous of degree 2, then identify its returns to scale?
14. List out any two assumptions of LPP.
15. Define Game theory.

(1X10=10)

Section B

Answer any ten of the following questions in two or three sentences each. Each question carries 2 marks.

16. Given the demand function, $P= Q^2+2Q+1$, write down the TR and MR function.
17. Examine the superiority of LPP in constrained optimization.
18. Given utility function, $U= xy+3x+4y$, find the marginal utilities of good x and y.
19. Discuss the technical constraints and the non-negativity constraints in LPP.
20. List out various types of economic functions.
21. Compare implicit and explicit functions.

22. Explain feasible and optimal solution.
23. Describe any two non-algebraic functions.
24. Distinguish between endogenous and exogenous variable.
25. Differentiate substitute goods and complementary goods.
26. List out the conditions of maximization of a single variable function.
27. Maximise: Z= XY +2X
    Subjected to the constraint: X+3Y = 18
28. Compare increasing returns to scale and decreasing returns to scale.
29. Describe Leontief matrix.
30. Compare homogeneous and non- homogeneous production functions.

(2X10=20)

Section C

Answer any five of the following questions in a paragraph each. Each question carries 4 marks.

31. Prove Euler's theorem using Cobb-Douglas production function.
32. Explain the scope of mathematical economics.
33. If demand curve under monopoly is $\alpha-\beta Q$. Verify that MR falls twice fast as AR as output increases.
34. From the demand function Q= 400-6P, find the price elasticity of demand at prices Rs4/-, Rs10/- and Rs 15/-
35. Explain various methods for calculating price elasticity of demand.
36. Find the dual of the following Linear Programming Problem.
    Max: Z= 3X1+X2+2X3
    Subject to,
    $X1+X2+X3 \leq 5$
    $2X1+X3 \leq 10$
    $X2+3X3 \leq 15$
    $X1, X2, X3 \geq 0$
37. Explain input-output analysis.
38. Explain the unique characteristics of mathematical economics
39. The demand curve of the monopolist is given as Q= -5P+1000. Find the output level and price at which TR is maximum.
40. Explain the applications of input-output analysis.

(4X5=20)

Section D

Answer any two of the following questions in two pages each. Each question carries 10 marks.

41. The technological coefficient matrix of 2 sectors is given as $A = \begin{bmatrix} 0.15 & 0.25 \\ 0.20 & 0.05 \end{bmatrix}$. If final demand of the two sectors are 600 and 1500 respectively. Find the gross output of the two sectors.

QP CODE
C1024

42. Derive the consumer equilibrium using indifference curve analysis.
43. Solve the following LPP using graphical method.
    Maximize, Z= 60X1+40X2
    Subject to,
    $2X1+X2 \leq 60$
    $X1 \leq 25$
    $X2 \leq 35$
    $X1, X2 \geq 0$
44. State any 5 properties of Cobb-Douglas production function with their proof.

(10X2=20)