**QP CODE**

**H1086**

**Enrollment Number: ……**

**Name: ……**

**BA DEGREE EXAMINATIONS, FEBRUARY 2026**
**Fourth Semester**
**B.A. ECONOMICS**
**B21EC01DE – Mathematical Economics**
**(2023 July 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. Define an economic model.
2. Define an algebraic function.
3. What is Marginal Rate of Substitution (MRS)?
4. What is income elasticity of demand?
5. What is the second-order condition for minimisation?
6. Define Hessian determinant.
7. Define Lagrange multiplier.
8. State the utility maximisation rule.
9. Define production function.
10. What is meant by returns to scale?
11. What is a slack variable?
12. What is meant by Input–Output Analysis?
13. What is the Hawkins–Simon condition?
14. What is a two-person game?
15. Gross output of an industry is 120 units.
    Intermediate demand is 40 units.
    Find the final demand.

**(1X10=10)**

## Section B

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

16. What is an explicit function? Give an example.
17. Define parameters with an example.
18. Distinguish between a variable and a constant.

19. Mention any two factors affecting price elasticity of demand.
20. The total cost (TC) of producing a commodity is given by:
    $TC=40+8Q+2Q^2$ , Find (a) Marginal Cost (b) MC when Q=4
21. Define cross elasticity of demand with examples.
22. What is budget constraint?
23. Explain degree of homogeneity.
24. Discuss any two applications of Linear Programming in Economics.
25. Explain the term feasible region.
26. What are the assumptions of linear programming?
27. Brief the concept of Game Theory and its relevance in economics.
28. Explain the viability of an Economy.
29. Distinguish between technical coefficients matrix and transaction matrix.
30. What is the role of constraints in an LPP?

**(2X10=20)**

## Section C

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

31. Discuss the scope of mathematical economics.
32. Find the maximum or minimum value of
    $z=x^2+y^2-6x+8y=30$
33. What is the economic significance of MRS and MRTS?
34. Explain the concepts of concavity and convexity of a function with suitable examples.
35. Discuss the economic significance of the Lagrange multiplier.
36. A firm's profit function is
    $\pi=50Q-5Q2$
    Find the level of output that maximises profit.
37. Explain returns to scale.
38. Explain Euler's Theorem in relation to production functions.
39. Solve the following LPP using the graphical method:
    Maximise $Z=3x+5y$
    Subject to: $x+y\leq 4$ ,$x+3y\leq 6$
    $x,y\geq 0$
40. An economy consists of two industries with the following technical coefficients:
    $a11=0.4$ $a12=0.2$, $a21=0.1$, $a22=0.3$
    Final demand is:
    D= (60, 40)
    Determine the required level of output of each industry.

**(4X5=20)**

# QP CODE

# H1086

## Section D

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

41. Explain the various cost concepts and distinguish between AC and MC functions.
42. Explain the importance of Game theory in Input-Output Analysis.
43. Explain the Cobb-Douglas production function and discuss its properties.
44. A consumer has a utility function
    U= xy
    Subject to the budget constraint.
    2x+y=100
    Find the utility-maximising values of x and y.

**(10X2=20)**