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SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION MARCH 2023

Economics

ECO 6B 12—MATHEMATICAL ECONOMICS

(2017—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A (Objective Type Questions)

Answer **all** *twelve questions.*
Each question carries ½ mark.

1. Input output analysis was developed by :

   (a) Hicks. (b) Marshall.

   (c) Leontief. (d) Gossen.

2. Cobb-Douglas production function satisfies :

   (a) Coase Theorem. (b) Euler's Theorem.

   (c) Hawk ' s Theorem. (d) Arrow's Theorem.

3. Identify the equilibrium condition of firm under perfect competition :

   (a) MC=MR.

   (b) MC curve must be falling at the point of equilibrium.

   (c) Both (a) and (b).

   (d) None of these.

4. Assume that Price = 10. Identify MR at the point on the demand curve where $e = 0.5$?

   (a) 1. (b) 5.

   (c) 10. (d) – 10.

5. Lagrange multiplier is a mathematical method for :

   (a) Minimization. (b) Maximization

   (c) Constraint optimization. (d) None of these.

Turn over

6. Shut down point is the point where :

(a) MC = MR. (b) P = MC.

(c) AVC = AR. (d) Price = AVC.

7. All of the solutions possible in the face of existing constraints are called :

(a) Optimal solution. (b) Feasible.

(c) Primal solution. (d) Dual solution.

8. When the marginal cost is less than average cost, the average cost :

(a) Rises. (b) Falls.

(c) Remains constant. (d) None of these.

9. The price elasticity of demand is a negative number which means :

(a) Demand is price elastic.

(b) Demand is price inelastic.

(c) The demand curve is downward sloping.

(d) An increase in income will reduce the quantity demanded.

10. Dual of the dual is :

(a) Dual itself. (b) Primal.

(c) Alternative. (d) None of the above.

11. ——— is the first order derivative of total utility :

(a) Average utility. (b) Marginal utility.

(c) Cardinal utility. (d) Maximum utility.

12. If an increase in income from 1000 to 1500 leads to rise in saving from 300 to 500, MPS is :

(a) 0.8. (b) 0.6.

(c) 0.5. (d) 0.4.

(12 × ½ = 6 marks)

Part B

Answer any ten questions.
Each question carries 2 marks.

13. Define MRTS.
14. Assume that the supply function is $X = 2P^5 + 5$. Find elasticity of supply when $P = 3$.
15. What is meant by price discrimination ?
16. Compute marginal utility from the total utility function $U = 5x^3 + 10x^2 + 12x + 9$
17. State Euler's theorem.
18. What is MPS ?
19. Define profit function.
20. What do you mean by discriminating monopoly ?
21. Define Mathematical economics.
22. What is optimal solution ?
23. What is meant by linear homogeneous production function ?
24. Define production possibility curve.

(10 × 2 = 20 marks)

Part C

Answer any **six** *questions.*
Each question carries 5 *marks.*

25. Explain the properties of Cobb- Douglas production function.
26. Assume that a firm's total cost function is $TC = Q^3 - 30Q^2 + 400Q + 500$. At what level of output is the firm's marginal cost equal to rupees 100 ?
27. Explain multivariable functions with suitable example
28. Find the AP, MP and output elasticity of capital and labour for the production function

    $Q = 10K^{0.7}L^{0.1}$.

29. Explain the assumptions of linear programming.
30. Define input output analysis. Explain the assumptions of input-output model.

Turn over

31. Examine the relationship between AR and MR with the help of a diagram.

32. Illustrate the relationship between primal and dual using an example.

(5 × 6 = 30 marks)

Part D

Answer any **two** *questions.*

Each question carries 12 *marks.*

33. Explain the meaning and derivation of the concept of elasticity. Differentiate between price elasticity income elasticity and cross elasticity

34. Explain linear programming. Solve using the Graphical method the following problem:

Maximize $Z = 3x + 2y$

subject to : $2x + y \leq 18$

$2x + 3y \leq 42$

$3x + y \leq 24$

$x \geq 0, y \geq 0.$

35. Define perfect competition. Explain the conditions for the equilibrium of a firm under per competition

36. What do you mean by optimisation ? Discuss the economic applications of optimisation

(2 × 12 = 24 m