

C 41755

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Name.....

Reg. No.....

**FOURTH SEMESTER M.A. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2023**

(CBCSS)

Economics

ECO 4E 09—MATHEMATICAL ECONOMICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Part A (Multiple Choice Questions)

Answer all questions.

Each bunch of five questions carries a weightage of 1.

1. The central idea of VES production functions is :

(a) σ is constant.	(b) σ is unitary.
(c) σ is varying.	(d) Can not Say.
2. Who introduced the input output technique ?

(a) Dauntzig.	(b) Leontieff.
(c) Nash.	(d) Pareto.
3. What is the dual of a dual under linear programming ?

(a) Primal.	(b) Dual.
(c) Objective Function.	(d) Feasible solution.
4. On a linear demand curve, price elasticity will be :

(a) Constant.	(b) Varying.
(c) Both (a) and (b).	(d) None of the above.
5. The necessary condition for profit maximisation under monopoly is :

(a) $P = MC$.	(b) $P = MR$.
(c) $AC = MC$.	(d) $MC = MR$.

Turn over

6. Given $\log Q = 0.8 \log K + 0.2 \log L$, What is the elasticity of capital ?
(a) 0.8. (b) 0.2.
(c) 1. (d) 1.6.
7. For the demand function $P = 10 - 2Q$, what is the value of MR when $Q = 2$.
(a) 6. (b) 8.
(c) 2. (d) 4.
8. The concept of duality is applicable in :
(a) Consumption. (b) Production.
(c) Profit function. (d) All of the above.
9. Cobb-Douglas production function $Q = AL^\alpha K^{1-\alpha}$ does not possess the characteristics of :
(a) Constant Returns to Scale.
(b) Unit Elasticity of Substitution.
(c) Variable Elasticity of Substitution.
(d) Linear homogeneity.
10. A demand curve, which is parallel to the horizontal axis, showing quantity, has the price elasticity equal to :
(a) Zero. (b) Infinity.
(c) Less than one. (d) One.
11. Which among the following is not related to Linear Programming ?
(a) Objective function. (b) Linear expenditure systems.
(c) Constraints. (d) Feasible region.
12. Which one of the following is not an assumption of linear programming ?
(a) Constant output prices.
(b) Constant input prices.
(c) Increasing returns to scale.
(d) Technologically fixed factor proportion.
13. Given a production function :
 $Q = AL^\alpha K^\beta ; \alpha, \beta > 0$, increasing returns to scale requires that :
(a) $\alpha + \beta = 1$. (b) $\alpha + \beta = 0$.
(c) $\alpha + \beta > 0$. (d) $\alpha + \beta > 1$.

14. For the Marginal Revenue function $MR = 20q + 5$, find the Total Revenue when output q is 10 :
- (a) 10. (b) 1050.
(c) 205. (d) 25.

15. Given that C.E.S. production

$$\text{function } P = \gamma [\delta L^{-\rho} + (1 - \delta) K^{-\rho}]^{-\mu/\rho}$$

What is μ denoted for ?

- (a) Distribution parameter. (b) Substitution parameter.
(c) Returns to scale parameter. (d) Efficiency parameter.

(15 × 1/5 = 3 weightage)

Part B (Very Short Answer Questions)

Answer any **five** questions.

Each question carries a weightage of 1.

16. Define elasticity of substitution
17. Distinguish between open and closed input output model.
18. Derive the Linear Expenditure system
19. Given $q = a^{-p}$ find price elasticity.
20. State the condition for maxima and minima.
21. What is linear homogeneous production function ?
22. What is technological coefficient matrix ?
23. Briefly explain the utility function.

(5 × 1 = 5 weightage)

Part C (Short Answer Questions)

Answer any **seven** questions.

Each question carries a weightage of 2.

24. Derive Roy's Identity through indirect utility functions.
25. Explain the multiple plant and multiple product monopoly.
26. Distinguish between ordinary and compensated demand functions.
27. Derive conditions for profit maximization under discriminating monopoly.
28. Given the utility function $U = XY$ and budget constraint $4X + 5Y = 100$. Find optimum quantity bundles of X and Y.

Turn over

29. A firm has the following total cost and demand functions :

$$C = q^3 - 50q^2 + 1000q + 2000 \text{ and}$$

$$R = 1525 - 5q^2$$

Find the profit maximizing level of output.

30. Explain prisoner's dilemma.
 31. Discuss technological progress and production function.
 32. Give an account on economic interpretation of a dual.
 33. What is a VES production function ?

(7 × 2 = 14 weightage)

Part D (Essay Type Questions)

Answer any **two** questions.

Each question carries a weightage of 4.

34. Derive the Slutsky theorem. Bring out its importance in economic analysis.
 35. Maximise :

$$Z = 10x_1 + 7x_2$$

$$\text{Subject to } 4x_1 + 3x_2 \leq 300$$

$$2x_1 + 3x_2 \leq 210$$

$$x_1, x_2 \geq 0.$$

using simplex method :

36. Give an account of input output technique. Explain its usefulness in economic analysis.
 37. Explain the properties of Cobb-Douglas Production function.

(2 × 4 = 8 weightage)