

D6BEC2002

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Reg.No.....

Name: .....

**SIXTH SEMESTER B.A.DEGREE EXAMINATION, APRIL 2023****(Regular/Improvement/Supplementary)****ECONOMICS****GECO6B12T: MATHEMATICAL ECONOMICS****Time: 2 ½ Hours****Maximum Marks: 80****SECTION A: Answer the following questions. Each carries two marks  
(Ceiling 25 Marks)**

1. Write a note on consumption function.
2. Define investment function.
3. What is meant by marginal propensity to consume?
4. Write a short note on marginal cost.
5. Define cross elasticity.
6. Comment on optimization.
7. What is meant by average revenue?
8. Optimize  $Y=3x^2 - xy + 2y^2 - 4x - 7y + 12$ .
9. If  $MR = 50$  Rs, and elasticity is 2 find AR.
10. Find price elasticity of demand  $Q= 2500 - 8P - 2P^2$  at  $P= 20$ .
11. Define Utility function.
12. What is meant by Marginal Rate of Technical Substitution?
13. Find marginal and average revenue when  $TR = 32Q - Q^2$ .
14. What is an economic model?
15. Define price discrimination.

**SECTION B: Answer the following questions. Each carries five marks.  
(Ceiling 35 Marks)**

16. Explain the meaning and importance of mathematical economics
17. What is meant by constraint optimization?
18. Explain the relationship between Average Revenue and Marginal Revenue
19. Explain the significance of Lagrange Multiplier
20. Write dual of the following linear programming problem

$$\text{Maximize } \pi = 2.5X_1 + 2X_2$$

$$\text{Subject to } x_1 + 2x_2 \leq 8000$$

$$3x_1 + 2x_2 \leq 9000$$

$$x_1, x_2 \geq 0$$

**(PTO)**

21. Optimize  $Z = 4x^2 - 2xy + 6y^2$  subject to  $x + y = 72$ .
22. What is meant by input output analysis?
23. Maximize profit if  $TR = 4000Q - 33Q^2$  and  $TC = 2Q^3 - 3Q^2 + 400Q - 5000$

**SECTION C: Answer any two questions. Each carries ten marks.**

24. Describe the properties of Cobb Douglas production function
25. What are the characteristics of a competitive market? With the help of mathematical techniques, explain how a competitive market achieve equilibrium.
26. Solve the following Linear programming problem Graphically

$$\begin{aligned} \text{Maximize } Z &= X_1 + 1.5X_2 \\ \text{Subject to } 2x_1 + 2x_2 &\leq 16 \\ x_1 + 2x_2 &\leq 12 \\ 4x_1 + 2x_2 &\leq 28 \\ x_1, x_2 &\geq 0 \end{aligned}$$

27. Define different types of elasticity of Demand. Explain different degrees of price elasticity of demand.

**(2 × 10 = 20 Marks)**