C 80392 (Pages : 4) Name.....

Reg. No.....

SIXTH SEMESTER B.A./B.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCBCSS—UG)

Economics

ECO 6B 12—MATHEMATICAL ECONOMICS

Time : Three Hours Maximum : 80 Marks

Part A

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

1. If total revenue, $TR = 100 - 100Q^2$, then what is the marginal revenue ?

   (A) $100Q^2$. (B) $100Q$.

   (C) $200Q$. (D) $200Q^2$.

2. Given the Cobb- Douglas Production function $Q = A K^{\alpha} L^{\beta}$, A refers to :

   (A) Managerial efficiency. (B) Marginal productivity.

   (C) Marginal profit. (D) Marginal revenue.

3. Lagrangian multiplier is a/an :

   (A) OLS method.

   (B) MLP method.

   (C) Constraint optimisation method.

   (D) Unconstraint optimisation method.

4. The marginal revenue curve in monopoly :

   (A) Equals the demand curve.

   (B) Is parallel with the demand curve.

   (C) Lies below and converges with the demand curve.

   (D) Lies below and diverges from the demand curve.

5. The output elasticity of labour measures :

   (A) $(\Delta Q)/(\Delta L)$. (B) $(\% \Delta Q)/(\% \Delta L)$.

   (C) $(\Delta L)/(\Delta Q)$. (D) $(\% \Delta L)/(\Delta L)$.

6. In perfect competition, shut down point is the point where :

(A) AR = AC. (B) AC = AVC.

(C) AVC = TC. (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. If P = 10, at the point on the demand curve where $e = 0.5$, MR is :

(A) 5. (B) 0.

(C) – 1. (D) – 10.

9. Which 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 proportions.

10. If the cross elasticity of demand is – 2 :

(A) The products are substitutes and demand is cross price elastic.

(B) The products are substitutes and demand is cross price inelastic.

(C) The products are complements and demand is cross price elastic.

(D) The products are complements and demand is cross price inelastic.

11. Find differential co-efficient of $2X^3 + 3X^2 + 4X + 10$:

(A) $6X^2 + 6X + 4$. (B) $6X + 6X + 4$.

(C) $6X + 3X + 4$. (D) $2X + 3X + 4X + 10$.

12. Empirical demand curves refer to demand curves estimated from :

(A) Actual market price - quantity observations.

(B) Utility theory.

(C) The new approach to consumer theory.

(D) None of these.

(12 × ½ = 6 marks)

Part B

Answer any **ten** *questions.*
Each question carries 2 *marks.*

13. Illustrate the Euler's theorem.

14. What is meant by marginal propensity to save ?

15. What is profit function ?

16. Define elasticity of substitution.

17. What is optimal solution ?

18. What is meant by linear homogeneous production function ?

19. Calculate MPC from the following information :

Income	Consumption
120	120
180	170

20. Distinguish between perfect competition and imperfect competition.

21. Briefly explain the meaning of price discrimination.

22. What do you mean by an input output model ?

23. Explain the primal- dual relationships in the linear programming.

24. Define production possibility curve.

(10 × 2 = 20 marks)

Part C

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

25. Explain the degree of homogeneity.

26. Explain multivariable functions with suitable example.

27. Find the AP, MP and output elasticity of capital and labour for the production function :

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

28. Explain the fundamental assumptions of linear programming.

29. Discuss the meaning and significance of Lagrange multiplier.

30. What are the necessary conditions for price discrimination ?

31. Discuss the assumptions of input-output model.

32. Illustrate the relationship between AR and MR with the help of a diagram.

(6 × 5 = 30 marks)

Part D

Answer any **two** *questions.*
Each question carries 12 *marks.*

33. State and illustrate the conditions for the equilibrium of a firm under perfect competition.

34. Prove that Cobb-Douglas production function is a linear homogeneous production function of degree one. Identify and prove its other important properties.

35. Find solution to the linear programming problem using graphical method :

Maximize $Z = X_1 + 1.5X_2$
subject to the constraints

$$2X_1 + 2X_2 \leq 16$$
$$X_1 + 2X_2 \leq 12$$
$$4X_1 + 2X_2 \leq 28$$
$$X_1, X_2 \geq 0.$$

36. Determine the relation between price and elasticity under monopoly market.

(2 × 12 = 24 marks)