



K20U 1869

Reg. No. : .....

Name : .....

**III Semester B.A. Degree (CBCSS (OBE)-Regular)  
Examination, November 2020  
(2019 Admission Only)**

**COMPLEMENTARY ELECTIVE COURSE IN ECONOMICS/DEV.ECONOMICS  
3C03 ECO/DEV ECO : Mathematical Economics – I**

Time : 3 Hours

Max. Marks : 40

**PART – A**

Short answer type questions. Answer **all** questions. **Each** carries **one** mark.

1. Define cross elasticity of demand.
2. What is Marginal Revenue ?
3. What is Parameter ?
4. Given  $Q = 700 - 2P + 0.02 Y$ , where  $P = 25$  and  $Y = 5000$ . Find price elasticity of demand.
5. Given  $TC = q^2 + 2q + 500$ . Find MC.
6. Given  $TR = 1400Q - 6Q^2$ .  $TC = 1500 + 80Q$ , then profit function is **(6×1=6)**

**PART – B**

Short essay type questions. Answer **any six** questions. **Each** carries **two** marks.

7. Explain the limitations of Mathematical Economics.
8. Explain the mathematical properties of indifferent curves.
9. Explain ordinary demand function.
10. What do you mean by non-homogenous production function ?
11. Given the following supply and demand functions for a good.  $q^s = p^2 + 4p + 8$ ;  
 $q^d = -0.5 p + 21$ . Find the equilibrium price and quantity.

P.T.O.

12. Given the total cost function  $TC = 3Q^2 + 7Q + 12$ . Find MC and AC.
13. Given  $Q = 700 - 2P + 0.02Y$  Where  $P = 25$  and  $Y = 5000$ . Find income elasticity of demand.
14. Given the demand function  $P = 30 - 2Q$ . Find marginal revenue function.

(6x2=12)

## PART - C

Answer **any four** questions. **Each** carries **three** marks.

15. Explain the scope of mathematical economics.
16. A firm producing two goods  $x$  and  $y$  has the profit function  $\pi = 64x - 2x^2 + 4xy - 4y^2 + 32y - 14$ . To find the profit-maximizing level of output for each of the two goods and test to be sure profits are maximized.
17. The inverse demand function for a good is  $P = -0.1q + 50$ .
- A) Find the total revenue function and the marginal revenue functions,  
B) Find the price and quantity at which total revenue is maximized ?
18. Given the following total cost TC function.  $TC = Q^3 - 5Q^2 + 60Q$ , find
- 1) the average cost AC function,
  - 2) the critical value at which AC is minimized, and
  - 3) the minimum average cost.
19. A monopolist sells two products  $x$  and  $y$  for which the demand functions are  $x = 25 - 0.5P_x$ ,  $y = 30 - P_y$  and the combined cost function is  $c = x^2 + 2xy + y^2 + 20$ . Find the profit-maximizing level of output for each product.
20. Given the demand for beef  $Q_b = 4850 - 5P_b + 1.5P_p + 0.1Y$  with  $Y = 10,000$ ,  $P_b = 200$  and the price of pork  $P_p = 100$ . Calculate the following
- 1) the income elasticity and
  - 2) the cross price elasticity of demand for beef.

(4x3=12)

## PART – D

Long essay type questions. Answer **any two** questions. **Each** carries **five** marks.

21. Explain the mathematical relationship between AR, MR and elasticity of demand.
22. What is CES production function ? Explain the properties of CES production function.
23. What is mathematical economics ? Explain the role of mathematics in economics.
24. A producer has the possibility of discriminating between the domestic and foreign markets for a product where the demands, respectively, are
- $$Q_1 = 21 - 0.1 P_1$$
- $$Q_2 = 50 - 0.4 P_2$$
- Total cost =  $2000 + 10 Q$  where  $Q = Q_1 + Q_2$ . What price will the producer charge in order to maximize profits
- With discrimination between markets and
  - Without discrimination ?
  - Compare the profit differential between discrimination and nondiscrimination.

(2×5=10)

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