



K21U 1870

Reg. No. : .....

Name : .....

III Semester B.A. Degree CBCSS (OBE) Reg./Sup./Imp.  
Examination, November 2021  
(2019 – 2020 Admission)

Complementary Elective Course in Economics/Development Economics  
3C03ECO/DEVECO : MATHEMATICAL ECONOMICS – I

Time : 3 Hours

Max. Marks : 40

PART – A

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

1. Define income elasticity of demand.
2. Define Variable.
3. What is Marginal Revenue ?
4. Given  $Q = 700 - 2P + 0.02Y$ , where  $P = 25$  and  $Y = 5000$ . Find income elasticity of demand.
5. Given  $TC = 2q^2 + 6q + 500$ . Find MC.
6. Given  $TR = 1100Q - 5Q^2$ ,  $TC = 1200 + 40Q$ , then profit function is **(6×1=6)**

PART – B

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

7. Explain the scope of mathematics in economics.
8. Explain compensated demand function.
9. What do you mean by homogeneous production function ?
10. Explain the properties of Cobb-Douglas production function.
11. Given the following inverse supply and demand function for a good, find the equilibrium price and quantity.  $P^s = 2q + 1$ ;  $P^d = -q^2 + 4$ .
12. Given the total revenue function  $TR = 12Q - Q^2$ . Find MR and AR.
13. Maximize the following total revenue  $TR = 32Q - Q^2(1)$ . Find the critical value(s)  
(2) Test second order condition.
14. Given  $Q = 700 - 2P + 0.02Y$  Where  $P = 25$  and  $Y = 5000$ . Find income elasticity of demand. **(6×2=12)**

P.T.O.



## PART – C

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

15. Explain ordinary demand functions.
16. Determine the level of homogeneity and returns to scale for each of the following production functions.
  - a)  $Q = x^2 + 6xy + 7y^2$
  - b)  $Q = x^3 + xy^2 + 3y^3 + x^2y$ .
17. Find the profit-maximizing level of a) output b) price, when  
 $Q_1 = 5200 - 10P_1$ ,  $Q_2 = 8200 - 20P_2$  and  $c = 0.1Q_1^1 + 0.1Q_1Q_2 + 0.2Q_2^2 + 325$
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. Given  $Q = 700 - 2P + 0.02Y$ , where  $P = 25$  and  $Y = 5000$ . Find (a) the price elasticity of demand and (b) the income elasticity of demand.
20. Use the  $MR = MC$  method to (a) maximize profit and (b) check the second-order conditions. Given  $TR = 1400Q - 7.5Q_2$ ,  $TC = Q_3 - 6Q_2 + 140Q + 750$ . **(4×3=12)**

## PART – D

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

21. Explain the price and output determination under discriminating monopoly.
22. Explain the mathematical relationship between AR, MR and elasticity of demand.
23. What is CES production function ? Explain the properties of CES production function.
24. What is mathematical economics ? Explain the role of mathematics in economics. **(2×5=10)**