



K24P 0222

Reg. No. :

Name :

**IV Semester M.A. Degree (CBSS – Reg./Supple. – (One Time Mercy
Chance)/Imp.) Examination, April 2024
(2014 Admission Onwards)
Economics/Development Economics
ECO4E15 : MATHEMATICAL ECONOMICS**

Time : 3 Hours

Max. Marks : 60

PART – A

Answer **all** the **eight** questions in Part – A. **Each** question carries ½ mark.

1. If there is no change in demand even after % change in the price, then it is termed as
 - 1) Relatively elastic demand
 - 2) Perfectly elastic demand
 - 3) Relatively inelastic demand
 - 4) Perfectly inelastic demand
2. Indifference curve approach is given by
 - 1) Alfred Marshal
 - 2) Adam Smith
 - 3) J. R. Hicks
 - 4) J. M. Keynes
3. A function $y = f(x)$ is said to be concave if its second order derivative is
 - 1) Positive
 - 2) Negative
 - 3) Unity
 - 4) Zero
4. The degree of homogeneity of function $f(x, y) = x^3 + xy^2 + x^2y + y^3$ is
 - 1) 1
 - 2) 2
 - 3) 3
 - 4) 4
5. Marginal production function for the production function $P = x^3 + 7x^2 - 12x + 46$ is
 - 1) $2x^2 + 14x - 12$
 - 2) $3x^2 + 14x - 12$
 - 3) $3x^2 + 13x - 12$
 - 4) $2x^2 + 14x - 11$
6. If $TC = 3Q^2 + 7Q + 12$, average cost when 2 units produced is
 - 1) 16
 - 2) 17
 - 3) 18
 - 4) 19

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7. AR/AR – MR gives the
- 1) Elasticity of demand
 - 2) Elasticity of cost
 - 3) Iso revenue
 - 4) Elasticity of supply
8. Given the utility functions $u = f(q_1, q_2)$. The functions will be maximized at
- 1) $\frac{du}{dq_1} = 0$
 - 2) $\frac{d^2u}{dq_1} < 0$
 - 3) both 1 and 2
 - 4) none of the above
- (8×½=4)

PART – B

Answer **any eight** questions in Part – B. **Each** question carries **2** marks. No answer should exceed **1½** pages **each**.

9. Find out Marginal Utilities of x for the Utility Functions $U = 9x^3 - 7x^2 - 3x + 3$.
10. If P is Rs. 15 and the elasticity is 3, find MR.
11. Find out if the function is homogenous. If yes find out the degree of homogenous function $f(x, y) = \frac{x^3 + x^2y}{x - y}$.
12. What is average productivity ?
13. If $X = 3kL^2 + 4k^2L + 2L + 2K$ is a production function, find the marginal product of L at $K = 1$ and $L = 2$.
14. No pens were sold when the price was 200 per pen and 50 pens are sold when the price is zero per pen. Derive demand function.
15. Given the revenue function $R = 300 - 1200Q - Q^2$, find out the average and marginal revenue functions.
16. Input coefficient matrix and final demand vector is given. Find output level.
17. What is Pure strategy in game theory ?
18. Compute marginal utility of x when $x = 1$ and $y = 2$ for the total utility function $U = 3x^2y + 4xy^2 + 2x + 2y$.
- (8×2=16)



PART – C

Answer **any four** questions in Part – **C**. **Each** question carries **5** marks. No answer should exceed **one** and **half** pages.

19. If $y = \frac{x^3}{x-2}$ is the production function, find the marginal production function.
20. Variable elasticity substitution production function.
21. A discriminating monopoly faces the cost function $C = 2 + Q_1 + Q_2$. Given the price function in two markets as $P_1 = 17 - 2Q_1$ and $P_2 = 25 - 3Q_2$. Find the profit maximizing price and quantity in each of these markets.
22. What is indirect utility function ?
23. Find out the dual of given primal problem.
Maximize
 $\pi = 3x_1 + 4x_2 + 3x_3$
subject to
 $x_1 + x_2 + 3x_3 \leq 12$
 $2x_1 + 4x_2 + x_3 \leq 42$
24. The average revenue function for a particular commodity is $y = 28 - 5x$ and the average cost to monopolist is $y = x + 4$. Determine the maximum profit obtainable by the monopolist. **(4×5=20)**

PART – D

Answer **any two** questions in Part – **D**. **Each** question carries **10** marks. No answer should exceed **six** pages.

25. What are the features of Cobb-Douglas production function ?
26. What are the uses and limitations of input output analysis ?
27. Let us assume that the utility function $U = f(x, y)$. The prices are $P_1 = \text{Rs. } 5$ and $P_2 = \text{Rs. } 5$ and consumer's income for the period is Rs. 50. Find out the consumer's equilibrium level of consumption of commodity x and y. Also prove the conditions for maximisation.
28. Find the elasticity of demand and MR, at $p = 2$, if the demand function $q = 30 - 5p - p^2$. Demand function $q = 30 - 5p - p^2$. **(2×10=20)**
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