K16P 0317

Reg. No. : .....

Name : .....

IV Semester M.A. Degree (Reg./Sup./Imp.) Examination, March 2016
ECONOMICS/DEVELOPMENT ECONOMICS (2014 Admn.)
Elective – ECO4E15 : Mathematical Economics

Time : 3 Hours Max. Marks : 60

PART – A

Objective type questions. Answer **all** questions.

1. Demand functions are homogenous of degree _____ in prices and income.
   a) Zero b) Two c) One d) None of these

2. Given the demand function :Q = 80 – 2P, the price elasticity is _____, when price equals 20.
   a) – 4 b) $-\frac{1}{4}$ c) – 1 d) $-\frac{1}{2}$

3. The locus of points of isoquants where the marginal products of the factors are zero is called
   a) Isocost line b) Isocline
   c) Expansion path d) Ridgeline

4. In CES production function, the elasticity of substitution varies from _____ to _____.
   a) 0 to 1 b) 0 to α
   c) $-\alpha$ to α d) – 1 to 1

5. If marginal revenue is Rs. 20 and price elasticity of demand is 2, then average revenue is
   a) 10 b) 40 c) 20 d) 60

P.T.O.

6. Degree of monopoly power and price elasticity of demand are _____ related.
   a) Inversely b) Directly c) Positively d) Not

7. The upper portion of the kinked demand curve is _____ than its lower portion.
   a) Less elastic b) More elastic
   c) Infinitely elastic d) None of these

8. The strategy of maximising the minimum gain is called
   a) Minimax b) Pure c) Maximin d) Mixed **(8×½=4)**

PART – B

Short answer questions, answer **any 8** questions. Answer should **not** exceed **1½** pages **each**.

9. Market demand : $D = 210 - 2P$ and market supply : $S = 90 + 4P$, find the market clearing equilibrium price and quantity ?

10. Define cross elasticity of demand. If the demand curve for a commodity is $Q = 20 - 4P_1 + 2P_2$, the own price of the commodity $(P_1) = 5$ and the price of the substitute $(P_2) = 10$, find the cross price elasticity of demand ?

11. The constant elasticity demand function : $\ln Q_x = \ln a + b \ln P_x + c \ln P_o + f \ln M + \ln u$, where Q_x is quantity demanded of commodity x, P_x is own price of x, P_o is price of related commodities, M is money income, u is the error term and ln is natural logarithm. What is the meaning of various coefficients ?

12. Define producer's equilibrium.

13. Define linearly homogenous production function.

14. Given production function : $Q = L^{0.52} K^{0.48}$. Find the marginal products of labor and capital.

15. Define marginal rate of technical substitution.

16. Derive the elasticity of substitution for the production function : $Q = AK^{\alpha}L^{\beta}$.

17. Given marginal cost function : $MC = 3Q^2 - 10Q + 25$. Find the total cost and average cost function, fixed cost is given as 40 units.

18. Explain third degree price discrimination.

19. Distinguish between pure and mixed strategy. **(8×2=16)**

PART – C

Short essay, answer **any 4** questions. Answer should **not** exceed **2½** pages **each**.

20. Mathematically derive the demand function of a consumer, given the utility function : $U = q_1 q_2$ and the budget constraint : $Y = p_1 q_1 + p_2 q_2$.

21. Explain the linear expenditure system.

22. State CES production function and explain its components.

23. What is duality in consumption ?

24. Find producer's surplus when supply function : $P = 10 + 4Q$ at demand $Q_0 = 30$?

25. State the first order and second order conditions for profit maximisation of a firm. **(4×5=20)**

PART – D

Long essay, answer **any two** questions. Answer should **not** exceed **6** pages **each**.

26. Derive and interpret the Slutsky equation.

27. What is an input demand function ? Derive it mathematically.

28. Define Cournot equilibrium. Suppose two firms produce homogenous product, market demand function : $P = 300 - Q$, where $Q = Q_1 + Q_2$ and the cost function for firm – 1 is $C_1 = 60\,Q_1$ and for firm – 2 is $C_2 = 60Q_2$. Calculate the Cournot equilibrium output and profit of each firm.

29. Explain linear programming. Solve the linear programming problem graphically.
    Maximize : $Z = 4x + 10y$
    Subject to : a) $x + 4y \leq 24$
    $3x + y \leq 21$
    $x + y \leq 9$
    b) $x, y \geq 0$ **(2×10=20)**

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