

Course Name: Mathematical Economics-I. Course Code: BSCHECOC202

Model Questions:

Multiple Choice Type

1. Variable is something a) whose magnitude is fixed b) whose magnitude can change c) parameter d) none of the above
2. $C = 100 + .5y$ the value of mpc is a) .5 b) .6 c) .7 d) .8
3. A null set is a) a set with one element b) a set with no elements c) a set with two elements d) a set with infinite elements
4. Demand function is homogeneous of degree zero in prices and income a) false b) true c) cannot be said without additional information d) none of these.
5. In a two-commodity world two goods cannot be inferior at the same time a) false b) true c) cannot be said without additional information d) none of these.
6. Elasticity of substitution in case of Cobb-Douglas production function is a) 0 b) 2 c) 1 d) 3.
7. In case of a rectangular hyperbolic demand curve price elasticity of demand is a) unity b) zero c) 2 d) none of these.
8. At the minimum point of the MC curve a) $AC = MC$ b) $AC > MC$ c) $AC < MC$ d) None of these.
9. When $MR = 0$, the value of price elasticity of demand is a) 0 b) 2 c) 1 d) 3
10. Expansion path generated by a Cobb- Douglas Production function is a) straight line b) nonlinear c) curvilinear d) concave
11. 2nd order condition for utility maximization subject to budget constraint requires a) Bordered Hessian determinant to be positive b) Bordered Hessian determinant to be negative c) Bordered Hessian determinant to be zero d) cannot be said without additional information
12. If the Cobb-Douglas production function be denoted as $q = AL^\alpha K^\beta$, α represents a) elasticity of output with respect to labour b) elasticity of output with respect to capital c) cannot be said without additional information d) none of these.

Objective type, Very Short Type, Short Type and Essay Type Questions

13. What is null set?
14. Define Homogeneous function.
15. Write down a Cobb-Douglas Production function.
16. $C = 50 + 10q$. Find AC and MC.
17. What is homothetic function?
18. State Hawkins-Simons Condition.

19. If $P = a - bq$ be the demand function, find MR
20. $C = 100 + .5y$. Determine MPC.
21. Define parameter.
22. $AR = 50 - 5q$, find the value of MR.
23. $C = 50 + 2q^2 + 5q$. Derive MC
24. Show different price elasticity segment along a linear demand curve.
25. $U = X^2 + 2XY + Y^2$. Determine MU_x
26. Write down the equation of a rectangular hyperbolic demand curve.
27. What do you mean by optimization?
28. Is budget set a convex set?
29. Define normal and inferior good.
30. $MC = 4 + 6q + 30q^2$. find total cost when fixed cost is 100.
31. $q = 50 - 25p$. find price elasticity of demand.
32. For a production function $q = -3L^3 + 18L^2$, show that $AP = MP$ when AP is maximum.
33. write down the equation of the expansion path.
34. State two main assumptions of the cobweb model.
35. Write down Slutsky equation.
36. $y = X^2$ determine whether the function is r convex or concave?
37. $q = Ak^\alpha L^\beta$ derive MPL and MPK.
38. Write down a CES production function and explain its parameters.
39. Find elasticity of substitution for the production function $q = AK^\alpha L^{1-\alpha}$
40. Demand function is given by $p = 35 - 2q - q$ and the demand $q_0 = 3$. Find consumer's surplus.
41. Define inferior good. Show that in a two goods world two goods cannot be inferior at the same time.
42. Derive the relationship between AR, MR and Price elasticity of demand.
43. $Z = X_1^2 + X_2^2$. Check whether it is convex or Concave?
44. Prove that if the demand function is downward sloping and concave, MR function is also downward sloping.
45. Prove that the isoquant generated by the CES production function is downward sloping and convex to the origin.

46. Find the optimum commodity purchase for a consumer whose utility function and budget constraint are $U=XY$ and $2X+5Y=100$. Also check second order condition.
47. Determine the maximum profit and the corresponding price and quantity for a monopolist whose demand and cost functions are $p=100-4q$ and $C=50+20q$
48. Show that if the demand curve is downward sloping and concave, marginal revenue curve is also downward sloping.
49. State and Prove Cournot aggregation condition.
50. State and prove Engel aggregation condition.
51. Show that demand curve is homogeneous of degree zero in prices and income.
52. Explain Cobweb Model.
53. State and prove the properties of CES production function.
54. State and prove the properties of Cobb-Douglas production function.
55. Derive Slutsky equation.
56. Show that the sum of price elasticity of demand, cross elasticity of demand and income elasticity of demand for a commodity is equal to zero.
57. State and Prove Euler's theorem.
58. Show that marginal revenue is less than price under monopoly.
59. Determine the price and quantity for a price discriminating monopolist whose demand and cost functions are $P_1=80-5q_1$, $P_2=180-2q_2$ and $C=50+20(q_1+q_2)$ respectively.
60. Define choice variable.
61. What do you mean by objective function?
62. Prove that budget set is a convex set.
63. Prove that price elasticity of demand is equal to unity at the midpoint of a linear demand curve.
64. Define a convex function.
65. What do you mean by concave function?
66. Prove that indifference curve is downward sloping and convex to the origin (Prove mathematically).
67. Prove that isoquant is downward sloping and convex to the origin (Prove mathematically).
68. Show that output maximization subject to cost constraint is equivalent to cost minimization subject to output constraint.
69. Show that demand curve is negatively sloped in case of normal good.