QP CODE

T5044

MA DEGREE EXAMINATIONS, MAY 2024
First Semester
M.A. Economics
M23EC04DC – Quantitative Methods for Economics I
(2023 July admissions)

Time: 3 Hours   Max Marks: 70

Section A

Answer any ten of the following questions in a word or sentence each. Each question carries 1 mark.

1. What is a Hypothesis?
2. Describe central limit theorem
3. Define Type I and Type II errors
4. What is a sampling distribution?
5. Compare finite and infinite sets
6. If A={2,3,4,├ 5}┤ and B= {3,5,7,├ 8}┤ , find A∩B.
7. Define universal set
8. Describe limit of a function
9. What is definite integral?
10. Define exponential function
11. What is mean by elasticity of demand?
12. Briefly explain the marginal product
13. What is producer's surplus?
14. What is linear programming problem?
15. Distinguish the incoming vector and outgoing vector in simplex method

                                                          (1X10=10)

Section B

Answer any five of the following questions in two or three sentences each. Each question carries 2 marks.

16. What is a confidence interval, and how is it related to hypothesis testing?

17. What is a one-tailed test, and when is it appropriate to use it?

18. Find $\lim_{x \to 3}[x^3(2x+5)]$

19. Suppose AC= 3Q+7, find MC

20. Find $\int_2^3 x^2 dx$

21. What is constrained optimisation?

22. State the conditions for a function to be minimum

23. Explain point of inflection.

24. Explain the steps in formulating a mathematical model for a given linear programming problem

25. Explain the procedure of deriving a dual from a primal LPP.

(2X5=10)

Section C

Answer any five of the following questions. Each question carries 4 marks.

26. What are the key steps involved in the estimation process?

27. What are some common assumptions in hypothesis testing, and why are they important?

28. Explain set operations

29. Suppose AC= 3Q+7, find MC and TC at Q=50

30. If $y = 3x^4 + 6x^2 + 2x + 1$, find $\frac{d^2y}{dx^2}$ at x=2.

31. Given the demand function Q= 165-3p-2p². Find the elasticity of demand at price =5

32. Explain the basic rules of integration

33. If f(x) $= \frac{x^3-2x^2-x+2}{x^2-3x+2}$, examine the continuity at x=1 and x=2.

(4X5=20)

Section D

Answer any three of the following questions. Each question carries 10 marks.

34. What is a function? Explain the various form of functions and major functions used in economics.

35. Find the maximum profit that a company can make if the profit function is given by Z= 41-24x-18x2.

36. Use simplex method to solve the following LPP

Maximise, $Z = 3x_1 + 5x_2$

Subject to the constraints,

$x_1 + x_2 \leq 2$

$2x_1 + 5x_2 \leq 10$

$8x_1 + 3x_2 \leq 12$

$x_1, x_2 \geq 0$

37. 10 plots of land are treated with fertilizer A and 12 plots with fertilizer B. the mean yield of the first plot is 6 bushels with a S.D of 0.03 bushels. The yield of second plots is 5.95 bushels with a S.D of 0.04 bushels. At 5% level of significance, is there any difference in average yield using different fertilizers?

38. What are non-parametric tests? Explain various non-parametric tests with its uses.

39. Optimize the function $f(x,y) = 2x^2 - 5xy + 3y^2$ subject to the constraint $x + 2y = 20$ using Lagrange multiplier method.

(10X3=30)