QP CODE
M2039

Enrollment Number: ……

Name: ……

MA DEGREE EXAMINATIONS, OCTOBER 2025
First Semester
M.A. Economics
M23EC04DC – Quantitative Methods for Economics I
(Supplementary/Improvement)
(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 meant by concave function?
2. If $y=\ln f(x)$, find dy/dx.
3. Define a set and give an example from Economics.
4. State the difference between Null Hypothesis (H_0) and Alternative Hypothesis (H_1).
5. Define Central Limit Theorem.
6. Name the probability distributions used for small sample tests.
7. Differentiate $f(x)=x^2+ 3x$.
8. Define an ordered pair.
9. Evaluate $\int 2x\, dx$
10. Name any two non-parametric tests.
11. Write the condition for Lagrange Multiplier Method in constrained optimisation.
12. Write any two assumptions of Linear Programming Problem (LPP).
13. What is a Type I error in hypothesis testing?
14. State the economic meaning of marginal cost.
15. State the rule of integration by parts.

(1X10=10)

Section B

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

16. Define *statistical inference* in one sentence and state one of its applications in economics.
17. If the total revenue function is $TR=50Q-2Q^2$, find the profit-maximizing output when total cost is $TC=10Q+100$?
18. Distinguish between Standard deviation and standard error.
19. Evaluate $\int_1^2 (3x^2)\, dx$.

20. Find the slope of the curve $y = x^2+2x$ at $x=3$.
21. Define consumer's surplus and using integration, write its expression under the demand function $P=f(Q)$
22. If $A = \{1,2,3\}$ and $B = \{a,b\}$, write $A \times B$. How many ordered pairs does it contain?
23. Explain in two sentences the economic meaning of profit maximization under calculus approach.
24. Distinguish between point estimation and interval estimation (any two points).
25. In a Linear Programming Problem, explain what is meant by a feasible region and an optimal solution.

(2X5=10)

Section C

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

26. Define the following four types of functions and write their general notations: Linear, Quadratic, Cubic, and Polynomial.
27. State and explain Fisher's properties of a good estimator.
28. Discuss the importance of sampling distributions in statistical inference. Illustrate with an example.
29. Describe the Simplex method for solving a Linear Programming Problem.
30. Given the cost function $C=100+20Q+Q^2$, find MC and AC. Compute at $Q=10$.
31. Define Analysis of Variance (ANOVA). Explain briefly how it is applied to test differences among group means.
32. The market supply function is $P = 20+2Q$ equilibrium $Q_0 = 10$, $P_0 = 40$ Compute Producer's Surplus using integration
33. Define the following terms in hypothesis testing: Critical Region, Level of Significance, Power of a Test, and Level of Confidence. (b) For a two-tailed Z-test at 5% significance level, state the critical region.

(4X5=20)

Section D

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

34. It is claimed that a random sample of 100 tyres with mean life of 15269 kms is drawn from a population of tyres which has a mean life of 15200 kms and standard deviation is 124.8 kms. Test the validity of the claim.
35. A company produces two types of chairs: Standard (S) and Deluxe (D). Each Standard chair requires 1 hour of carpentry and 2 hours of painting, while each Deluxe chair requires 3 hours of carpentry and 2 hours of painting. The company has 12 hours of carpentry and 10 hours of painting available per day. The profit per Standard chair is ₹50 and per Deluxe chair is ₹80. Formulate a Linear Programming Problem to maximize profit.

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36. Evaluate: 1. $\int xe^x dx$ 2. $\int (2x^2 - 5x + 7) dx$
37. Explain the difference between relation and function in mathematics. Illustrate each concept using examples.
38. Explain the important properties of the following sampling distributions: Chi-square, F, t, and Z.
39. Discuss in detail the various applications of integration in the field of Economics.

(10X3=30)