Roll.No. | 20USTCT4007

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Statistics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - IV
20USTCT4007 - Statistical Inference - I

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. (a) Define point estimation.
   (b) State Neyman's Factorization Theorem
2. Explain the Method of Minimum Variance and Method of Moments
3. Compute a confidence interval for the ratio of two population variances $\frac{\sigma_1^2}{\sigma_2^2}$using the F-distribution.
4. Define tests of significance. Distinguish between one-tailed and two-tailed tests with examples.
5. Define the following terms with examples:
   (a) MVUE
   (b) BLUE
6. Differentiate between Method of Minimum Chi-Square and Modified Minimum Chi-Square Method.
7. Define interval estimation. What is a confidence interval? Illustrate with an example.
8. Examine the procedure of paired t-test and explain when it is used.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain unbiasedness, consistency, efficiency, and sufficiency with suitable examples.
10. State and Prove Cramer Rao Inequality.
11. Examine the Method of Maximum Likelihood (MLE) in detail and Determine the MLE for the parameter λ of an exponential distribution.

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12. Compute $100(1-\alpha)\%$ confidence interval for the population mean μ when the population standard deviation σ is known, based on the Normal distribution.

13. (a) Assess the procedure for testing significance of correlation between two variables using the t-distribution.
    (b) Evaluate Chi-square test for goodness of fit

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