

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. END SEMESTER EXAMINATIONS APRIL-2022

SEMESTER - IV

20UMAAT4004 - Mathematical Statistics - II

Total Duration : 3 Hrs.

Total Marks : 60

Section A

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

1. Derive the additive property of X^2 variates.
2. If T is an unbiased estimator for θ , show that T^2 is a biased estimator for θ^2 .
3. Define Consistency and Efficiency.
4. Explain Maximum Likelihood estimator.
5. Explain Method of moments.
6. Define Null Hypothesis Alternate hypothesis.
7. Explain Type I error and Type II error.
8. Explain Chi - square test of Goodness of fit.

Section B

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

9. Derive Student's - t distribution.
10. State and prove Cramer - Rao inequality.
11. Obtain $100(1-\alpha)\%$ confidence intervals for the parameter θ of the normal

distribution $f(x, \theta; \sigma) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x - \theta}{\sigma}\right)^2\right], -\infty < x < \infty.$

12. Explain the procedure for testing of hypothesis.
13. Describe the χ^2 test for independence of attributes.
