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.(Maths) END SEMESTER EXAMINATIONS APRIL-2023
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. If X_1, X_2, ..., Xn are random observations on a Bernoulli variate X taking the value 1 with probability p and the value 0 with probability *(1-p)* show that $\dfrac{\sum x_i}{n}\left(1 - \dfrac{\sum x_i}{n}\right)$ is a consistent estimator of *p(1-p)*.

2. Define Unbiasedness and show that if T is an unbiased estimator for θ then T^2 is a biased estimator for θ^2.

3. State and Prove Cramer Rao Inequality.

4. Let X_1, X_2, ..., Xn be a random sample from a uniform population $[0, \theta]$ find a sufficient estimator for θ.

5. Explain the properties of Maximum Likelihood Estimator.

6. Write a note on Method of Moments.

7. Describe the method of obtaining confidence Interval for proportions.

8. How will you test the significance of mean in the case of single mean and difference of two means?

Section C

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

9. State and prove Neyman-Fisher factorization theorem.

10. State and establish Rao-Blackwell theorem. Describe Rao-Blackwellisation technique for obtaining UMVUE.

11. Prove that for large samples, the estimators obtained by the methods of maximum likelihood and minimum chi-square are same.

12. Compute 100(1 - α) % confidence interval for the parameter
    i) θ ii)σ^2 of the Normal distribution.

13. Explain the method of Goodness of fit.

*****