M.Sc DEGREE EXAMINATION,APRIL 2019
I Year I Semester
Biostatistical Inference - I

Time : 3 Hours   **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define point estimation.
2. State Chapman-Robbins inequality.
3. Define BLUE.
4. What do you mean by sufficiency of an estimator?
5. Define likelihood function.
6. What is method of minimum chi-square?
7. Give an example of censored data
8. Give the 100(1-α)% confidence interval for mean of Normal distribution.
9. Define Baye's estimator.
10. What do you mean by conjugate prior?
11. When a statistic is said to be complete?
12. State any two properties of UMVUE.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Prove that S is an unbiased estimator of σ of Normal distribution.
14. State and prove Rao-Blackwell theorem.
15. Prove that Minimum variance unbiased estimator is unique.
16. Find the MLE for the parameter λ of a Poisson distribution. Also find its variance.
17. If a sufficient estimator exists, then prove that it is a function of MLE.
18. Obtain 100(1-α)% confidence interval for ratio of variances.
19. Give a brief note about prior and posterior distribution in Bayesian inference.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. State and prove Cramer's Rao inequality.

21. State and Prove Lehmann-Scheffe theorem.

22. Show that the sample mean $\overline{x}$ in random sampling from.

    f $(x,\theta)= (1/\theta)\exp(-(x/\theta))$, $0<x<8$, o otherwise, when $0<\theta<8$, is an MLE estimator of θ and has variance θ^2/n.

23. Construct 100(1-α)% confidence interval for population variance of Normal distribution N(μ σ^2).

24. Prove that Gamma family is conjugate for Poisson family.

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24. Prove that Gamma family is conjugate for Poisson family.