B.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year IV Semester
Statistical Inference - I

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Define Efficiency.
2. Define Consistency.
3. What do you mean by BLUE?
4. Define Unbaisedness.
5. What is the difference between central and non-central moments?
6. Define the methods of moments.
7. What do you understand by confidence limits?
8. Define Student's t-distribution.
9. Define Most Powerful Test.
10. What are the two types of errors?
11. Define Chi-Square test.
12. Define Level of significance.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. State and prove Neyman Factorization Theorem.
14. Show that $\overline{X} = \sum_{i=1}^{n} \frac{X_i}{n}$, in random sample from $f\left(x\left|\theta\right.\right) = \begin{cases} \frac{1}{\theta}\left(e^{\frac{-x}{\theta}}\right) & 0 < \text{x} < \propto \\ 0 \ , \textit{otherwise} \end{cases}$ where 0<θ<∞ is in MVB estimator of θ and has variance θ^2/n
15. Write any four properties of Maximum Likelihood Estimator.
16. Let X ˜ N(θ,σ^2) , Construct the confidence interval for θ when $\sigma^2$is known.
17. Explain the test for the mean of a Normal population, when is σunknown.
18. State and prove Cramer Rao- Inequality.
19. State and prove Rao- Blackwell Theorem.

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

Answer any **THREE** questions

20. State and prove Sufficient conditions for consistency.
21. Prove that UMVUE is unique.
22. Find the MLE of the parameters α and λ of the distribution
$f(x, \alpha, \lambda) = \frac{1}{\sqrt{\lambda}} \left(\frac{\lambda}{\alpha}\right)^{\lambda} e^{\frac{-\lambda x}{\alpha}} x^{\lambda-1}$; $0 \leq x < \infty$, λ>0
23. Construct the confidence interval for ratio of two normal population parameters.
24. Explain the procedure for test for the equality of means of two populations, when the variances are equal.

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