1311E1134

Candidate's Seat No :_____

B.Sc. (NEP) Sem.-5 Examination

DSC-C-351

Statistics

Time : 2-00 Hours] **November-2025** **[Max. Marks : 50**

Instructions: 1. Figures to the right indicate full marks of respective questions.

2. Use of a Scientific Calculator is allowed.

Q.1 (A) Show that for normal distribution Sample mean is consistent estimator but sample median is not consistent. **(05)**

(B) Show that sample mean is not an unbiased estimator of θ for the distribution. Find unbiased estimator of θ. **(05)**

$$f(x,\theta) = \begin{cases} 1; \theta < x < \theta + 1 \\ 0; Otherwise \end{cases}$$

OR

(A) Explain Method of Moments **(05)**

(B) Obtain the estimate of θ by method of moments for the following pdf. **(05)**

$$f(x,\theta) = \theta x^{(\theta-1)}, 0 \leq x \leq 1, \theta > 0$$

Q.2 (A) Explain Method of Moments. Obtain moment estimate of sample mean in case of Poisson Distribution. **(05)**

(B) Stating regularity conditions State and prove Cramer Rao inequality. **(05)**

OR

(A) Explain method of MLE, Write properties of MLE. **(05)**

(B) Estimate the parameter p in B(n, p) by method of MLE. **(05)**

Q.3 (A) Explain the procedure to obtain 95% confidence interval for population mean μ. When the sample is drawn from N (μ, σ2) and population variance is unknown. **(05)**

(B) Explain the procedure to obtain 99%confidence interval for difference of two mean when population SD is known. **(05)**

OR

(A) If T_1 and T_2 are two unbiased estimators of θ then show that infinite set of unbiased estimators can be generated from T_1 and T_2. **(05)**

(B) Discuss the procedure to calculate 99% CI for population proportion **(05)**

Q.4 (A) What is Run? Explain Run test? **(05)**

(B) Explain difference between parameter and non-parameter. **(05)**

OR

P.T.O

(A) Explain Wilcoxon sign Rank Test? (05)

(B) Write a short note on Mann-Whitney U test. (05)

Q.5 Attempt any ten out of twelve. (10)

1. In case of large samples write the mean and variance of run test.
2. Define Unbiasedness
3. Define sufficiency
4. Define statistics.
5. In usual notation show that $E(\bar{x})=\mu$
6. Define Mean Square Error consistency.
7. Write properties of MLE.
8. What is interval estimator?
9. Write the sampling distribution of sample proportion.
10. Write the sampling distribution of difference of two means.
11. Explain confidence coefficient.
12. In sign test which distribution is used?

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