11326

Reg. No. | | | | | | | | |

III Semester B.Sc. Degree Examination, March/April - 2021

STATISTICS - III

Statistical Inference - I

(CBCS Scheme Freshers & Repeaters 2019-20 & Onwards)

Paper : III

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

1. Answer any **Ten** sub-divisions from section A and any **Five** questions from Section B.
2. Scientific calculators are allowed.

SECTION - A

I. Answer any **TEN** sub-divisions from the following : **(10×2=20)**

1. a) What is sampling distribution?

   b) Define scale family of pdfs with an example.

   c) Define asymptotic unbiasedness.

   d) If t is an unbiased estimator of θ, then prove that t^2 is a biased estimator of θ^2.

   e) Define efficiency of an estimator.

   f) State C-R inequality.

   g) Obtain moment estimator of λ in Poisson distribution.

   h) What is meant by pivotal quantity? Give an example.

   i) Write confidence limits for the binomial proportion P.

   j) Write confidence limits for the mean μ of normal distribution.

   k) Write a note on simulation.

   l) Mention the advantages of simulation.

[P.T.O.

SECTION - B

II. Answer any **FIVE** of the following questions. **(5×10=50)**

2. a) Obtain mean and variance of chi - square distribution.

   b) Show that all odd-ordered central moments of t-distribution vanish **(6+4)**

3. a) Obtain mode of chi-square distribution.

   b) Obtain the distribution of reciprocal of F-variate. **(5+5)**

4. a) Show that sample mean is an unbiased estimator of λ of poisson distribution.

   b) State and prove sufficient conditions for the consistency of estimators. **(4+6)**

5. a) Obtain consistent estimator of μ in $N(\mu,\sigma^2)$ distribution, where σ^2 is known.

   b) Obtain the relative efficiency of sample mean with respect to sample median, when the random sample is taken from a normal $N(\mu,\sigma^2)$ distribution. **(4+6)**

6. a) Obtain sufficient estimator of λ in $P(\lambda)$ distribution.

   b) Obtain MVB estimator of μ in $N(\mu,\sigma^2)$ distribution. where σ^2 is known. **(4+6)**

7. a) Obtain MLE of P in Bernoulli B(1,P) distribution.

   b) Obtain moment estimators of $\alpha and \beta$ in $V(\alpha,\beta)$ distribution. **(4+6)**

8. a) Obtain $(1-\alpha)$ 100% confidence limits for Variance σ^2 of a normal distribution when μ is known.

   b) Derive $(1-\alpha)$ 100% confidence limits for the difference of two population means $(\mu_1-\mu_2)$ when population variances are known. **(5+5)**

9. a) Explain a method of drawing random samples from normal distribution.

   b) Describe the method of generating random samples from an exponential distribution. **(5+5)**