



Reg. No. :

Name :

**V Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.M./B.C.A./B.S.W./
B.A. Afsal-UI-Ulama Degree (CCSS-Reg./Supple./Improv.)
Examination, November 2013
Core Course in Statistics
5 B06 STA : STATISTICAL INTERFERENCE – I**

Time : 3 Hours

Max. Weightage : 30

Instruction : Use of calculators and statistical tables are permitted.

PART – A

Answer **any ten** questions. Weightage **1 each**.**(1 each)**

1. Define chi square distribution.
2. State the relation between normal, t and chi square distributions.
3. Define minimum variance bound estimator.
4. State Rao-Bleckwell theorem.
5. Define a sufficient estimator.
6. Is sample variance an unbiased estimator of population variance ? Give reason.
7. Define Bayes' estimator.
8. If a random sample is taken from a population with p.d.f. $f(x) = \frac{1}{\theta} \quad 0 < x < \theta$ find an estimator for θ using the method of moments.
9. Explain confidence coefficient.
10. Estimate the parameters of the binomial distribution if the mean of the sample is 6 and variance $\frac{3}{2}$.
11. Distinguish between point estimation and interval estimation.

(10×1=10)

P.T.O.



PART – B

(2 each)

Answer **any six** questions : Weightage **2** each.

12. Explain the method of minimum variance.
13. Write a short note on sufficient estimator.
14. If $f(x) = \frac{1}{b-a}$ $a < x \leq b$, find the MLE's of a and b .
15. A sample of 400 items are taken from a population whose S.D. is 1.5. The mean of the sample is 2.5 calculate the 95% confidence interval for the population mean.
16. If X follows chi square distribution with n degrees of freedom, find the mean of X .
17. Obtain the MVB estimator for θ , in random sampling from $f(x) = \frac{1}{\theta} e^{-\frac{x}{\theta}}$; $0 < x < \theta$ and also find its minimum variance.
18. A random sample of size 15 from a normal population with mean 12 is found to have variance equal to 5. Find the probability that the mean of the sample is less than 10.
19. What are the properties of a good estimator ? Explain.
20. Distinguish between point estimation and Interval estimation. (6×2=12)

PART – C

(4 each)

Answer **two** questions : Weightage **4** each.

21. State and prove Cramer-Rao inequality.
22. a) Explain the concept of sampling distribution.
b) Derive the distribution of the variance of random samples of size n drawn from a normal population.
23. Derive the MLE of
 - i) μ when σ^2 is known and
 - ii) σ^2 when μ is known, if a random sample is taken from a normal population $N(\mu, \sigma^2)$.
24. Derive 100 (1- α) % confidence interval for μ when a random sample is taken from a normal population $N(\mu, \sigma^2)$ when
 - i) σ^2 is known
 - ii) σ^2 is unknown. (2 × 4 = 8)