



M 6344

Reg. No. : .....

Name : .....

IV Semester B.Sc. Degree (CCSS-Regular/Suppl./Impr.)

Examination, May 2014

Complementary Course in Statistics for Maths/Computer Science (Core)

4 C04 STA : STATISTICAL INFERENCE

Time : 3 Hours

Max. Weightage : 30

**Instruction : Use of calculators and Tables permitted.**

PART – A

Answer any 10 questions. Weight 1 each.

1. What is meant by "Statistical inference" ?
2. Distinguish between parameter and Statistic.
3. Define Sampling distribution and Standard error.
4. Define  $\chi^2$  statistic and state its probability density function.
5. Define 'F' statistic.
6. Distinguish between estimator and estimate.
7. Define MUBE.
8. Define power of a test.
9. Define simple and composite hypothesis.
10. State the applications of students-t-distribution in testing of hypothesis.
11. Define non-parametric test. (10×1=10 Weight)

P.T.O.



## PART – B

Answer **any six** questions. Weight **2** each.

12. State the interrelationship between  $t$ ,  $\chi^2$  and  $F$  distributions.
13. State and prove additive property of  $\chi^2$  distribution.
14. Explain the desirable properties of a good estimator.
15. Describe the maximum likelihood method of estimation.
16. Obtain an estimator for  $\lambda$ , Poisson parameter, by method of moments.
17. Explain the procedure for testing the equality of two population means using exact samples.
18. Explain the procedure for testing independence of attributes by using a  $r \times s$  contingency table.
19. The mean and standard deviation of a sample of size 60 are found to be 145 and 40. Construct 95% confidence interval for population mean.
20. If  $X \geq 1$  is the critical region for testing  $H_0 : \theta = 2$  against  $H_1 : \theta = 1$ , on the basis of a single observation from the population  $f(x; \theta) = \theta e^{-\theta x}$ ;  $\theta > 0$  and  $0 < x < \infty$ . Obtain  $\alpha$  and  $\beta$ . **(6×2=12 Weight)**

## PART – C

Answer **any two** questions. Weight **4** each.

21. Obtain the sampling distribution of sample mean  $\bar{X}$  based on a sample of size 'n' from a population having mean  $\mu$  and variance  $\sigma^2$ .
22. Show that the sample variance  $s^2$  is biased and consistent estimator of population variance  $\sigma^2$ .
23. The scores of 10 candidates prior and after a training are given below :
 

<b>Prior :</b>	84	48	36	37	54	69	83	96	90	65
<b>After :</b>	90	58	56	49	62	81	84	86	84	74

 Is the training effective ?
24. In a sample of 600 high school students from a state 400 are found to use dot pens. In another sample of 900 from another state 450 are found to use dot pens. Do the data indicate that the states are significantly different with respect to the habit of using dot pens among students. **(2×4=8 Weight)**