



K17U 0691

Reg. No. :

Name :

IV Semester B.Sc. Degree (CBCSS – Reg./Supp./Imp.)
Examination, May 2017
(2014 Admn. Onwards)
**COMPLEMENTARY COURSE IN STATISTICS FOR MATHS/
COMP.SCIENCE CORE
4C04STA : Statistical Inference**

Time : 3 Hours

Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions : (6×1=6)

1. Define parameter.
2. What is meant by unbiasedness ?
3. What are the sufficient conditions for an estimator to be consistent ?
4. What is a null hypothesis ?
5. Define critical region.
6. What is meant by size of a test ?

PART – B
(Short Essay)

Answer **any 6** questions : (6×2=12)

7. If T is an unbiased estimator for θ , show that T^2 is biased for θ^2 .
8. Explain sufficiency with an example.
9. Explain the method of maximum likelihood estimation.
10. State Neymann-Pearson Lemma.

P.T.O.



11. What do you mean by confidence interval ?
12. Write the probability distributions of 't' and F distributions.
13. Obtain the moment estimator of θ using a random sample x_1, x_2, \dots, x_n drawn from a Poisson distribution with parameter θ .
14. What are the applications of χ^2 distribution ?

PART – C

(Essay)

Answer **any 4** questions :

(4×3=12)

15. Obtain the sampling distribution of sample mean of samples drawn from a normal population.
16. The mean and standard deviation of a sample of size 60 are found to be 45 and 40 respectively. Construct a 95% confidence interval for the population mean.
17. Distinguish between Type 1 error and Type 2 error.
18. Describe the χ^2 test for goodness of fit.
19. A claim is made that A star college students have an I Q of 120. To test this claim, a random sample of 10 students was taken and their I Q scores are recorded as follows :

105, 110, 120, 125, 100, 130, 120, 115, 125, 130. At 0.05 level of significance test the validity of the claim.
20. Suppose X is a Bernoulli random variable with parameter p. We take a random sample of four observations of X and want to test $H_0 : P = \frac{1}{4}$ versus $H_1 : P = \frac{3}{4}$. If we reject H_0 only if we get four success in the sample, compute the values of α and β .



PART – D
(Long Essay)

Answer **any 2** questions :

(2×5=10)

21. Define t and F statistics. Establish the relationship between, t, f and χ^2 statistics.
22. Obtain the 95% confidence interval for the variance σ^2 of a normal population $N(\mu, \sigma^2)$:
 - 1) When μ is known
 - 2) When μ is unknown.
23. Explain the uses of t-distribution in testing of hypothesis.

Below are given the gain in weights (in kgs) of Pigs fed on two diets A and B.

Gain in Weight

Diet A : 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25

Diet B : 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22.

Test whether the two diets differ significantly as regards their effect on increase in weight.

24. Explain paired t-test.

A certain stimulus administered to each of the 12 patients resulted in the following increase of blood pressure.

5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4 and 6 can it be concluded that the stimulus well, in general, be accompanied by an increase in blood pressure ?
