

FACULTY OF SCIENCE
B.Sc. IV-Semester (CBCS) Examination, May / June 2019

Subject : Statistics

Paper – IV : Inference (DSC)

Time : 3 Hours

Max. Marks: 80

PART – A (5 x 4 = 20 Marks)
(Short Answer Type)

Note : Answer any FIVE of the following questions.

- 1 Define Null and Alternative Hypothesis.
- 2 Explain Most powerful Test.
- 3 Write the General test procedure of Large sample test.
- 4 Define order Statistic.
- 5 Explain Yate's correction for continuity.
- 6 Write the assumptions of t-test.
- 7 Define Run and Length of Run.
- 8 Define Non parametric test and write its any two advantages over parametric tests.

PART – B (4 x 15 = 60 Marks)
(Essay Answer Type)

Note: Answer ALL from the questions.

- 9 (a) State and prove Neymann-Pearson Lemma. Explain its importance in testing the hypothesis.
OR
(b) Obtain Most powerful critical region for testing $H_0 : \mu = \mu_0$ Vs $H_1 : \mu = \mu_1$ for $N(\mu, \sigma^2)$ population.
- 10 (a) (i) Explain the large sample procedure for testing the equality of two population standard deviations.
(ii) In a random sample of 500, the mean is found to be 20. In another independent sample of 400, the mean is 15. Could the samples have been drawn from the same population with SD 4.
OR
(b) (i) Explain Fisher's Z transformation. Explain its applications.
(ii) Describe the large sample test procedure for equality of two proportions.
- 11 (a) (i) Describe chi-square test for testing goodness of fit.
(ii) Derive the chi-square test for 2x2 contingency table.
OR
(b) (i) Explain the small sample test procedure for testing the equality of population variances.
(ii) Explain t-test of significance of single mean.

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- 12 (a) (i) Explain Wald Wolfowitz run test for testing the equality of two population distribution functions.
- (ii) To determine the percent shrinkage of a synthetic fibre, tests were made at two different temperatures. 10 tests were at lower temperature and higher temperature. The resulting data are given below:

Shrinkage	1	2	3	4	5	6	7	8	9	10
Low temperature	4.7	2.3	4.78	4.14	3.63	3.66	3.92	4.54	4.3	3.8
High temperature	3.1	4.2	4.1	4.4	4.05	3.5	3.75	4.04	4.1	5.3

Use an appropriate non parametric test to type whether the percent shrinkage of a synthetic fiber were made at two different temperature are equal OR not.

OR

- (b) (i) Explain Parametric tests Vs Non Non Parametric tests.
- (ii) Explain Mann-Whitney U-test procedure.

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