# FACULTY OF SCIENCE

B.Sc. IV Semester (CBCS) Examination, January / February 2021

## Subject : Statistics

### Paper – IV – Inference

Time : 2 Hours

Max. Marks: 80

## PART – A

Note: Answer any four questions.

(4 x 5 = 20 Marks)

1 Define null-hypothesis and alternate hypothesis, critical region and power of test. Give one example for each.

2 Define randomized and non-randomized test functions. Give two examples for each.

3 Describe large sample test for single proposition.

4 Explain Fisher's z-transformations for two samples and associated test procedure.

5 Explain t-test for single mean.

6 Explain $\chi^2$ – test for 2x2 contingency table for independence of attributes.

7 Explain use of central limit theorem in testing. Give two examples.

8 Describe one sample sign test.

## PART – B

Note: Answer any three questions.

(3 x 20 = 60 Marks)

9 Let $x_1, x_2, \ldots\ldots, x_n$ be a random sample from poisson population with parameter $\lambda$. Obtain the best critical region for testing $H_0 : \lambda = \lambda_0$ against

$H_1 : \lambda > \lambda_0$ at $\alpha\%$ level of significance.

10 State and prove Neyman – Pearson lemma.

11 Explain the large sample test procedure for difference of standard deviations.

12 Explain the large sample test procedure for difference of means.

13 Describe the test procedures based on Snedecor's F-distribution for homogeneity of population variances and $\chi^2$ – test procedure for population variance.

14 Explain the test procedures for sample correlation coefficient based on students t-distribution and paired t-test. https://www.osmaniaonline.com

15 Explain two sample signed rank test for small samples along with its large sample approximation. Compare the same with sign test.

16 (i) Describe Mann-Whitney u-test for small samples. Also give its large sample approximation.

(ii) Compare parametric and non-parametric test.

\* \* \*