Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27

B.Sc. STATISTICS - IV SEMESTER

SEMESTER END EXAMINATION: APRIL 2022

(Examination conducted in July 2022)

ST 418 – Statistical Inference II

Time- 1 ½ hrs **Max Marks-35**

*This question paper contains **ONE** printed page and **THREE** parts.*

Part A

I Answer any 5 questions. 2x5=10

1. Define MLR property. Name any two distributions which possesses this property.
2. Define Fisher's Z-transformation. Give its applications in large sample tests.
3. Give the test statistic for testing independence of attributes in a 2x2 contingency table with proper notations and degrees of freedom.
4. Define Non-parametric test. Name any four types of non-parametric tests.
5. Give the test statistic for testing median of the population using one sample signed rank test with proper notations.
6. Define Mann Whitney U-test. Give its test statistic for testing equality of two distributions with proper notations.
7. Define Kolmogorov Smirnov one sample test. Why it is useful?

Part B

II Answer any THREE questions. 5x3=15

8. Construct a UMP test procedure to test H_0: $p = p_0$ against H_1: $p > p_0$ when X_1, $X_2 \ldots, X_n$ be a random sample from B (1, p).
9. Describe a test procedure for testing the equality of two variances for small samples when population means are unknown.
10. Describe a test procedure for testing the significance of an observed regression coefficients for small samples.
11. Discuss a test procedure for testing equality of population proportions in two populations for large samples.
12. Briefly describe the test procedure for testing median of the population using Sign test for one sample.

Part C

III Answer any ONE question. 10x1=10

13. a. Construct an LRT procedure for testing H_0: $\mu = \mu_0$ against H_1: $\mu \neq \mu_0$ when X follows Normal with mean μ and variance σ_0^2, known. (7)

    b. Define Run test. Find the number of runs and length of the longest runs in the following sequence. ABBAAABBBBAAAAAAAABBAAABBBBBBBBBBBBABAA (3)

14. a. Describe a test procedure for testing equality of means when the observations are paired. (5)

    b. Briefly explain the test procedure for testing goodness of fit in an observed frequency to a theoretical frequency distribution. (5)

****