LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc.DEGREE EXAMINATION – **STATISTICS**

FOURTH SEMESTER – **APRIL 2019**

16/17UST4MC01– TESTING OF HYPOTHESES

Date: 03-04-2019   Dept. No.   Max. : 100 Marks

Time: 09:00-12:00

Part A

Answer ALL the Questions: (10*2=20)

1. What is meant by Type-I error?

2. Define most powerful test.

3. Define two-tailed test with example.

4. Define standard error.

5. Explain degrees of freedom with examples.

6. What is composite hypothesis

7. What are the uses of Chi-square test?

8. Define run test.

9. Write any two disadvantages of non-parametric test.

10. Define sign test.

Part B

Answer any FIVE questions: (5×8=40)

11. Describe critical region and acceptance region.

12. A single observation is taken from f(x,)= $e^{-\theta x}$ θ≥0; 0 x   to test H$_0$: =2 against H$_1$: =1. Find the best critical region.

13. Mention the properties of likelihood ratio test

14. Derive the method of testing the significance of equality of two sample proportions

15. The score of 10 candidates performance after training are given below. Test whether the given training is effective

| prior | 84 | 48 | 36 | 37 | 54 | 69 | 83 | 96 | 90 | 65 |
| after | 90 | 58 | 56 | 49 | 62 | 81 | 84 | 86 | 84 | 75 |

16. Explain SPRT.

17. Two random samples of size 11 and 9 were taken from the two Normal populations and the corresponding S.D is 0.8 & 0.5. Test whether the population variance are equal against the alternative hypothesis is that are not equal at 10% level.

18. Explain the test for the hypothesis about population variance.

Part –C

19. State and prove Neymann Pearson lemma

20. a) Obtain the most powerful test of size α for testing $H_0: \theta = \theta_0$ VS $H_1: \theta = \theta_1$ in $N(0, \sigma^2)$

    b) Define

   i.   Uniformly most powerful test

   ii.   Likelihood ratio test

21. Construct the SPRT for the testing $H_0: \theta = \theta_0$ against $H_1: \theta = \theta_1$ ($\theta_1 > \theta_0$) in sampling from normal

population with mean θ and variance σ^2 (known)also obtain its OC function and ASN

22. a) Explain median test for the two samples

    b) Explain Mannwhiteney U-TEST

★★★★★★★