LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FOURTH SEMESTER – **APRIL 2018**

16UST4MC01– TESTING OF HYPOTHESES

Date: 20-04-2018 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 of a statistic.
5. Define the best critical region.
6. What is composite hypothesis
7. Mention any two uses of Chi-square test.
8. Obtain the number of runs in the sequence xxyyxxxyxxyyyxx.
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 $f(x,\theta)=\theta e^{-\theta x}$ $\theta \geq 0$; $0 \leq x \leq \infty$. To test H_0: $\theta=2$ against H_1:$\theta=1$. Find the best critical region of size 0.05.

13. Show that the family U(0, θ), θ > 0 has MLR property.

14. Explain how you will test for the significance of difference between two samples Proportions.

15. The scores of 10 candidate's performance before and after training are given below. Using Sign test, verify whether the given training is effective

Before	84	48	36	37	54	69	83	96	90	65
After	90	58	56	49	62	81	84	86	84	75

16. Explain the concepts of SPRT

17. The increase in weight when children are given two different diets A and B in the same period measured in pounds are

Diet A	8	5	7	8	3	2	7	6	5	7
Diet B	3	7	5	6	5	4	4	5	3	6

Test whether the diets are significantly different.

18. Explain the test for the significant for variance of normal distribution.

Part –C **Answer any two questions** **(2*20=40)**

19. State and prove Neymann Pearson lemma

20. a) Obtain the most powerful test of size α for testing $H_0:\sigma = \sigma_0$ VS $H_1:\sigma = \sigma_1$ in $N(0,\sigma^2)$

b) Eplain

(i). uniformly most powerful test

(ii). Likelihood ratio test

21. Derive the LRT for testing the equality of means of two independent Normal populationswith equal variance.

22. a) Explain median test for the two samples.

b) Explain Mann - Whitney U-test.

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