LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2019**

ST 5510 – TESTING OF HYPOTHESIS

Date: 29-10-2019   Dept. No.   Max. : 100 Marks

Time: 09:00-12:00

SECTION - A

Answer all the questions.   **(10 X 2 = 20)**

1. Define the best critical region.

2. What is Type II Error?

3. Define Most Powerful Test.

4. Define one parameter exponential family

5. State Monotone Likelihood ratio property.

6. Define likelihood ratio test.

7. State the applications of F Test.

8. Define run and length of a run.

9. Mention any two uses of chi square test.

10. Differentiate between parametric and non parametric test.

SECTION- B

Answer any five questions.   **(5 X 8 = 40)**

11. Describe the steps involved in testing statistical hypothesis.

12. Given $f(x,\theta) = \frac{1}{\theta}, 0 \le x \le \theta$ For testing H_0: $\theta=1$ against H_1:$\theta=2$ based on single observation. What would be the size of Type I and Type II error if we choose the critical region as i) x 0.5   ii) 1 x 1.5.

13. A coin is tossed 5 times and H_0 rejected if more than 3 heads are obtained find the probability of Type I and II Error. H_0: $p=\frac{1}{2}$ against H_1:$p=\frac{3}{4}$.

14. Define one parameter exponential family and show that the family of Bernoulli distribution possesses MLR property.

15. Explain the concept of SPRT.

16. Derive the likelihood ratio test for a mean of a normal population(μ, ^{2}), where ^{2} is known.

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 mean of diets are significantly different.

18. Explain Wilcoxon signed rank test.

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SECTION- C

Answer any two questions.   **(2 X 20 = 40)**

19. State and prove Neymann-Pearson lemma.

20. a) In a test given to two groups of students the marks obtained are as follows:

First Group	18	20	36	50	49	36	34	49	41
Second Group	29	28	26	35	30	44	46		

Examine the significance of difference between the arithmetic mean marks scored by the students of the above two groups.

b) Discuss the merits and demerits of non parametric test.

21. Derive the LRT for testing the equality of means of two independent normal populations with equal variance.

22. a) Perform Kruskal-Wallis test for the following data on three college students performance:

College A	25	70	60	85	95	90	80
College B	60	20	30	15	40	35	
College C	50	70	60	80	90	70	75

b) Explain Kolmogorov Smirnov test.

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