



Date: 23-04-2019

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

**Part – A**

**Answer ALL the Questions**

**(10 x 2 = 20 marks)**

1. What do you mean by testing of Hypothesis?
2. Define Critical Region.
3. What is UMP TEST?
4. Define power of the test.
5. Mention the properties of Likelihood Ratio test.
6. What do you mean by LR test?
7. Define F- Distribution.
8. State any two Applications of Chi- Square Distribution.
9. Mention the uses of Non-parametric tests.
10. State the assumptions of Non-parametric tests.

**Part – B**

**Answer any FIVE Questions**

**(5 x 8 = 40marks)**

11. Explain about Type I error and Type II error.
12. Let 'p' be the probability that a coin will fall head in a single toss. In order to test  $H_0: p=1/2$   
Against  $H_1: p=3/4$ , the coin is tossed 5 times and  $H_0$  is rejected if more than 3 heads are obtained. Find the probability of type I error and power of the test.
13. Describe the concept of Likelihood Ratio Test.
14. Explain the procedure of operating characteristic function in SPRT.
15. Explain about the procedure of Run Test.
16. Explain the concepts of SPRT.
17. Explain about the procedure of Median Test.
18. Discuss about the advantages and disadvantages of parametric and non-parametric methods.

**Part – C**

**Answer any TWO Questions**

**(2x20=40marks)**

19. a. State and prove Neymann-Pearson Lemma.  
b. Explain the procedure for testing the Hypothesis.

20. a. Given the frequency function:

$$f(x) = \begin{cases} \frac{1}{n}, & 0 \leq x \leq n \\ 0, & \text{elsewhere} \end{cases}$$

and you are testing  $H_0: \mu = 1$  against  $H_1: \mu = 2$ , by means of a single observed value of  $x$ . What would be the probabilities of the type I and II error, if you choose the interval

(i)  $0.5 \leq X \leq 1.5$ , (ii)  $1 \leq X \leq 1.5$  as the critical regions? Also obtain the power function of the test.

b. Discuss with an example that UMP test does not exist always.

21. a. Explain the test procedure for testing the equality of variances of two normal populations.

b. Explain the applications of Chi-square distribution in testing of hypothesis.

22. a. Describe the procedure of testing the Goodness of Fit.

b. Discuss the procedure for one sample Kolmogorov-Smirnov test.

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