**B.Sc. DEGREE EXAMINATION, NOVEMBER 2015.**

**III YEAR — V SEMESTER**

**Major Paper — STATISTICAL INFERENCE - II**

**Time : 3 hours Max. Marks : 60**

**SECTION A — (10 × 1 = 10 marks)**

**Answer any *TEN* questions.**

1. Define power of a test.
2. What is a statistical hypothesis?
3. Define power function.
4. What is mean by Uniformly Most Powerful Test?
5. Write any two properties of likelihood ratio test?
6. Define Likelihood Ratio Test.
7. What is meant by a non-parametric test?
8. Define sign test.
9. Define Loss function.
10. Define Risk function.
11. Define two types of errors.
12. Define the best critical region.

**SECTION B — (5 × 4 = 25 marks)**

**Answer any *FIVE* questions.**

1. Given the frequency function:  What would be the sizes of the type I and type II errors if 0.5$\leq x $in the critical region for lestonj H0:$θ$=1 against H1:$θ$=2 by means of a single observed value of *x*.
2. Write down the properties of Monotone likelihood ratio.
3. Discuss the general approach of likelihood ratio test.
4. Distinguish between ‘Sign test’ and ‘Wilcoxon signed tesst’.
5. Give in brief the idea of sequential probability ratio test.
6. Explain the basic concepts of a statistical hypothesis. Discuss the problems associated with the testing of simple and composite hypotheses.
7. Explain Mann-Whitney U test.

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. State and prove Neyman-Pearson Lemma.
2. Explain UMP test for the parameters of univariate Normal.
3. How do you test the equality of variances of two independent univariate normal populations?
4. Describe briefly Kolmogorov-Smirnov Test.
5. Define the OC and ASN function in sequential analysis. Derive their approximate expressions for the sequential probability ratio test of a simple hypothesis against a simple alternative.

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