LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **APRIL 2016**

ST 5510/ST 5505/ST 5501 – TESTING OF HYPOTHESIS

Date: 30-04-2016   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 understand by testing of Hypothesis?

2. Define Type II error.

3. Define UMP Test.

4. Define power of the test.

5. What do you mean by LR test?

6. State the properties of Likelihood Ratio test.

7. Mention the assumptions under which significance tests are applied.

8. State any two properties of Chi-square distribution.

9. What are the limitations of Non-parametric tests?

10. When to use Non-parametric methods?

PART – B

Answer any FIVE Questions   **(5 x 8 = 40 marks)**

11. If $x \geq 1$ is the critical region for testing $Ho: \theta = 2$ against the alternative $\theta = 1$, on the basis of the single observation from the population $f(x,\theta) = \theta.\exp(-\theta x)$, $0 < x < \infty$, obtain the values of probability of Type I and Type II errors.

12. Use Neymann – Pearson Lemma to obtain the region for testing $\theta = \theta o$ against $\theta = \theta 1 > \theta 0$ and $\theta = \theta 1 < \theta 0$, in the case of a normal population $N(\theta, \sigma^2)$, where σ^2 is known.

13. Explain the concept of Likelihood Ratio Test.

14. Discuss the procedure for test of significance for large sample test.

15. Derive the likelihood ratio test for a mean of a Normal population $N(\mu, \sigma^2)$, where σ^2 is known.

16. Explain the concepts involved in SPRT.

17. State the advantages and disadvantages of Non-parametric tests.

18. Explain briefly any two non-parametric tests and specify the situation in which they are applicable.

PART – C

Answer any TWO Questions   **(2 x 20 = 40 marks)**

19. a. Explain the terms:

       i) Critical Region.

       ii) Errors of Type I Error and Type II.

       iii) Most powerful test.

   b. State and prove Neymann-Pearson Lemma.

20. a. Derive the LRT for the equality of means of two normal populations with population variances being unequal.

   b. illustrate that the UMP test does not exist always.

21. a. Explain the procedure for testing the Hypothesis.

   b. Explain about the confidence interval. How will you determine the confidence interval for normal population mean.

22. a. Explain about the procedure for testing Mann- Whitney U-test.

   b. Briefly explain about the Median test procedure.

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