LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION - **STATISTICS**

FIFTH SEMESTER – NOVEMBER 2015

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

Date : 07/11/2015 Dept. No. Max. : 100 Marks

Time : 09:00-12:00

PART – A

Answer **ALL** questions **(10x2=20 Marks)**

1. Write short notes on simple and composite hypothesis.
2. Define randomized test.
3. Define Uniformly Most Powerful test.
4. What do you mean by level of significance? What does 5% level of significance imply?
5. Which tests of hypothesis are called two-tailed tests and give a suitable example for it.
6. Mention any two properties of LRT.
7. Write down the steps involved in a test of significance procedure for large samples.
8. Define confidence Intervals.
9. What are the applications of t-distribution in test of significance?
10. Which types of tests are called non-parametric tests?

PART – B

Answer any **FIVE** questions: **(5x8=40 Marks)**

11. Describe the steps involved in testing of statistical hypothesis.
12. Let $X_1, X_2, ..., X_n$ is a random sample from $N(«, ±^2)$, where $±^2$ is known. Find a UMP test for testing $H_0 : « = «_0$ against $H_1 : « = « > «_0$.
13. Describe the procedure of Sequential Probability Ratio Test.
14. Derive a likelihood ratio test for the variance of a normal population $N(«, ±^2)$ when « is known.
15. Describe the procedure of Median test.
16. Discuss the merits and demerits of parametric and non-parametric methods.
17. Explain testing the goodness of fit?
18. Write the procedure for Kolmogrov two sample tests.

PART – C

Answer any **TWO** questions: **(2x20=40 Marks)**

19. (a) State and prove Neyman – Pearson Lemma.

(b) Given the density function $f(x,^{-}) = \begin{cases} \frac{1}{=},0 < x < ^{-} \\ 0, \text{ otherwise} \end{cases}$, you are testing the null hypothesis H_0: θ = 1 against H_1: θ = 2, by means of a single observed value of x. What would be the sizes of the type-I and type-II errors if you choose the interval (i) $0.5 \leq x$ and (ii) $1 \leq x \leq 1.5$ as the critical regions? Also obtain the power function of the test.

20. (a) (i) Describe the applications of chi-square distribution in testing of hypothesis.

(ii) Explain the test procedure for testing equality of variances of two normal populations.

(b) Derive a LRT for equality of means of two independent normal populations with common unknown variance.

21. (a) Illustrate that UMP test does not exist always.

(b) Explain the test of independence of attributes in contingency tables.

22. (a) Describe the method of Mann-Whitney-Wilcoxon U-test.

(b) Explain the sign test for one sample and two samples.

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