

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

B.Sc. DEGREE EXAMINATION – STATISTICS

FIFTH SEMESTER – APRIL 2010

**ST 5501 - TESTING OF HYPOTHESES**

Date & Time: 27/04/2010 / 1:00 - 4:00

Dept. No.

Max. : 100 Marks

**PART – A**

Answer **ALL** questions

**(10x2=20 Marks)**

1. Define simple and composite hypotheses
2. Define type I and type II errors.
3. What are randomized tests?
4. Explain uniformly most powerful test
5. Mention any two properties of LRT.
6. Distinguish between one tailed tests and two tailed tests.
7. Write down the steps involved in a test of significance procedure for large samples.
8. What are the applications of t-distribution in test of significance?
9. Distinguish between parametric and non-parametric methods.
10. Define Run and length of a run.

**PART – B**

Answer any **FIVE** questions

**(5x8=40 Marks)**

11. A random sample of size 1 is drawn from a population with density function  $f(x; \theta) = \theta x^{\theta-1}; 0 < x < 1, \theta > 0$  in order to test  $H_0 : \theta = 1$  against  $H_1 : \theta = 2$ . Let  $H_0$  be rejected if  $x_1 > 0.98$ . Find the probabilities of 2 types of errors.
12. Derive a likelihood ratio test for a mean of normal population  $N(\mu, \sigma^2)$  when  $\sigma^2$  is known.
13. (a) Explain Randomized test procedure  
(b) Explain Power of a test and power function.
14. Describe the procedure of Sequential Probability Ratio Test.
15. Differentiate parametric and non- parametric procedures.
16. Explain Kolmogrov-Smirnov one sample test.
17. What is paired 't' test? What are its assumptions? Explain the test procedure
18. Based on a sample of size n (n greater than or equal to 30), construct a 95% confidence interval for the population mean.

**(P.T.O.)**

**PART – C**

Answer any **TWO** questions

**(2x20=40 Marks)**

19. (a) State and prove Neymann-Pearson theorem.
- (b) Derive the LRT for equality of means of two independent normal populations with common unknown variance.
20. (a) (i) What are 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) Explain the test of independence of attributes in contingency tables.
21. (a) A coin is tossed 6 times and  $H_0 : p = 0.5$  is rejected if the number of head is less than 2.  
Find the size of the test, if  $H_1 : p = \frac{4}{5}$ . Also find the power of the test.
- (b) Explain Wald-Wolfowitz Run test for two samples.
22. (a) Explain the sign test for one sample and two samples.
- (b) Explain Mann-Whitney-Wilcoxon U-test.

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