LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2016**

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

Date: 05-11-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

Answer ALL questions **(10 x 2=20)**

1. Define null and alternate hypothesis.
2. What is type I error?
3. Define Most powerful test.
4. What do you mean by parameter space?
5. What is likelihood ratio test?
6. Write the ASN function for SPRT.
7. How to calculate the expected frequencies in chi-square test?
8. Give the test statistic for testing the difference between two population variances.
9. Define non-parametric test.
10. Write any two advantageous of non parametric test.

PART– B

Answer any FIVE questions **(5 x 8 = 40)**

11. 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.
12. Explain Most powerful randomized test.
13. Prove that a random sample of n observations on X~B(m,θ) satisfies MLR property.
14. Describe the method of constructing likelihood ratio test.
15. How do you find the operating characteristic function of SPRT.
16. Random samples of 400 men and 600 women were asked whether they would like to have a fly-over near their residence . 200 men and 325 women were favour of it. Test the equality of proportion of men and women in the proposal?
17. Obtain 100(1-α)% confidence interval for mean of normal population $N(\mu,\sigma^2)$ where σ^2 is known
18. Explain Mann-Whitney U test.

PART – C

Answer any TWO questions **(2 x 20 = 40)**

19. (a) Explain the terms simple, composite hypothesis, one-tailed and two tailed test. (8 marks)

    (b) Obtain the Most powerful test for testing H: $\mu=\mu_0$ against K: $\mu=\mu_1$ using a random sample of n observations from $N(\mu, \sigma^2)$,σ^2 is known at level α. (12 marks)

20. (a) Given a random sample $X_1,X_2,\ldots,Xn$ from the distribution with p.d.f $f(x;\theta)=\theta\exp\{-\theta x\}$, , $x>0$, show that there exists no UMP test for testing $H_0 : \theta=\theta_0$against $H_1: \theta=\theta_1$

    (b) The result of a certain survey shows that out of 50 ordinary shops of small size, 35 are managed by men of which 17 are in cities, 12 shops in villages are run by women. Can it be inferred that shops run by women are relatively more in villages than in cities. Use chi-square test.

21. Give the SPRT for testing $H_0 : \theta=\theta_0$against $H_1: \theta=\theta_1$ $(>\theta_0)$in sampling from a Normal density where σ is known

22. a) Test whether the median cholesterol is 200 using sign test for the following cholesterol level data of heart patients: 230, 167, 250, 345, 442, 190, 200, 248, 289, 262, 301.

    b) Perform kruskal-wallis test for the following data on three college students performance:

College A :	25	70	60	85	95	90	80
College B :	60	20	30	15	40	35	
College C :	50	70	60	80	90	70	75

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