PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION JUNE 2018
(Fourth Semester)

Branch STATISTICS

STATISTICAL INFERENCE -II

Fimc: Three Hours **Maximum: 75 Marks**

Answer ALL questions
ALL questions carry EQUAL marks (5 x 15 = 75)

1 a Explain the following terms
(i) Two kinds of errors in testing of hypothesis
(ii) Level of Significance

b Distinguish between Randomized and Non Randomized test.

OR

c Slate the Neyman-Pearson Lemma.

d Using NP Lemma obtain BCR for testing H_0 :0 = 0_Oagainst 111 :0 = 0] > 0_o & 0 — 0j < 0_o. in the case of a normal population N(0,cU) where a" is known.

2 a Define an unbiased test.

b Given a random sample x!.x_2..x_n from the distribution with p.df f(x,0)=:c'°\ x>0. Show that there exists no UMP test for testing 11_0 :0 = 0Q against LI j : 0 ^ 0_o

OR

c Define UMP Lest.

d Prove that every most powerful (MP) or uniformly most powerful(UMP) critical region is necessarily unbiased if W be an MPCR of size a for testing II_0 :0 = 0_o against Hi :0 = 0| then it is necessarily unbiased.

3 a Explain the concept of Likelihood Ratio test.

b Describe the likelihood ratio test procedure for testing equality of means of two normal population.

OR

c Given a random sample size n from the normal population with mean p and variance a where p and a are unknown. Obtain the likelihood ratio test for testing H_0 : p = p_0 against H, : p * p_0

d Discuss the concept of Chi square Goodness of fit.

Cont...

4 ■ a Explain the test procedure for SPRT.

b Give the SPRT for testing T I_o : 0 = 0() against . H , : 0 = O_1 . (>0,,) in sampling from a normal density f(x.0) =—!= $\frac{1}{\sigma\sqrt{2}}$ expi- - $\frac{1}{2}\left|\frac{x-0}{\sigma}\right|^2$ - oo < x < oc where o is known. Also obtain its OC function.

OR

c Define ASN function of SPRT.

d Let X have the distribution f(x,0) O^x(I -0) .x^r 0,1, 0<0< 1 for testing H_o : 0 = OQ against IT, :0 = 0,. Construct SPRT and obtain its ASN function.

5 a Give the advantages of non parametric methods.

b Discuss briefly Rolmogorov-Smirnov test of goodness of fit in case of one sample.

OR

c Discuss the procedure for (a) Test for Randomness

(b) Median Test

d What assumptions are generally made for a non parametric test?

Z-Z-Z LND