PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Fourth Semester)

Branch-STATISTICS

STATISTICAL INFERENCE -II

Time: Three Hours **Maximum: 75 Marks**

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

1 a Explain simple and composite hypothesis with an example.

b Explain Randomized and non-randomized tests with an example

OR

c Explain the term : (i) Level of significance and (ii) Power function.

d State and prove the Neymann - Pearson lemma based on Randomized test

2 a Define unbiased test. What will happen when the test is biased?

b Show that the most powerful test of the NP lemma, for testing a simple hypothesis against a simple alternate hypothesis, is strictly unbiased, if $0 < a < 1$.

OR

c Define test with Neymann structure.

d State and prove the necessary and sufficient condition for all similar tests to have Neymann structure.

3 a Explain the concept of Likelihood Ratio tests.

b Prove that the LR test will be the same MP test given by the NP lemma when both H and K are simple.

OR

c If £(x) is the LR for testing H: 0 = 0Q against K: 0 = , where 0 is a scalar, then show that the asymptotic distribution of $\sim 2£_n.£(x)$ is $X^2(i)$ •

d Explain chi-square test for goodness of fit.

4 a Explain SPRT. Also explain OC and ASN function with respect to SPRT.

b Obtain the SPRT for testing H: 0 = 0Q against K: 0 = 0j using random observations sequentially made on $X \sim N(0, a^2)$, where a^2 is known.

OR

c Show that the SPRT actually terminates with probability[7] one.

d In the usual notation, prove that $E[S_n] = E(N).E(Zi)$.

5 a Explain non-parametric test and state its advantages.

b Explain Kolmogorov - Smirnov one sample test procedure.

OR

c Explain the concept of Run test.