PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2019
(Fourth Semester)

Branch – **STATISTICS**

STATISTICAL INFERENCE-I

Time : Three Hours   Maximum : 75 Marks

SECTION-A (20 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 2 = 20)

1   Define Unbiasedness.
2   Define Point Estimation.
3   Explain sufficient statistic .
4   Define minimum variance unbiased estimators.
5   Give the names of various methods of estimation.
6   Write any two properties of maximum likelihood estimations.
7   Define F-distribution.
8   Define Confidence interval.
9   Define Run-Tests.
10   What are the types of Non-parametric tests?

SECTION - B (25 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a   Show that $\left[\dfrac{\Sigma xi(\Sigma xi - 1)}{n(n-1)}\right]$ is an unbiased estimate of θ^2 ,for the sample

$x_1,x_2….x_n$ drawn on x which takes Re values 1 or 0 with respective probabilities θ and $(1-\theta)$.

OR

b   Discuss briefly on Efficient Estimators.

12 a   Let $x_1,x_2……x_n$ be a random sample from a uniform population on $[0,\theta]$. Find a sufficient estimator θ.

OR

b   State and explain the Fisher-Neyman Criterion.

13 a   Explain the methods of minimum variance.

OR

b   If for a given population with p.d.f.$f(x,\theta)$an MVB estimator T exists for θ, then likelihood equation will have a solution equal to the estimator T. Prove that the above statement and explain.

14 a   Explain the properties of 't'-distribution.

OR

b   A sample of size 25 yielded mean equal to 33and an estimated variance equal to 100. At the 1% level would you have reasons to doubt the claim that the population mean is not greater then 27?

Cont…

15 a   Write the procedure of Sign. Test.

OR

b   A dice is tossed 120 times with the following results.

No. turned up :	1	2	3	4	5	6	Total
Frequency :	30	25	18	10	22	15	120

Test the hypothesis that the dice is unbiased.

SECTION - C (30 Marks)
Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16   If Tn is a consistent estimator of $\gamma(\theta)$ and $\Psi\{\gamma(\theta)\}$. Is a continuous function of $\gamma(\theta)$, then $\Psi(Tn)$ is a consistent estimator of $\psi\{\gamma(\theta)\}$.

17   Let $x_1, x_2 \ldots x_n$ be a random sample from a distribution with p.d.f $f(x,\theta) = e^{-(x-\theta)}, \begin{array}{c} \theta < x < \infty \\ -\infty < \theta < \infty \end{array}$ obtain sufficient statistic force.

18   Describe the properties of maximum likelihood estimators.

19   The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70,64,64,66 inches. Is it reasonable to believe that the average height is greater than 64inches? Test at 5% level of significance level assuming that for q d .f p(t>1.83)=0.05.

20   Describe median test in detail.

Z-Z-Z   END