PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2017 | *A-STU* | **J2.**
(Fourth Semester)

Branch- STATISTICS

BASIC SAMPLING THEORY

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

SECTION-A (20 Marks)

Answer ALL questions

ALL questions carry EQUA/.L marks (1 0 x 2 = 20)

1 Define sampling unit.
2 What do you mean by sampling frame?
3 Prove that in SRS, the sample mean is an unbiased estimator of population mean.
4 Define simple random sampling.
5 State the principles of stratification.
6 What is proportional allocation?
7 Define systematic sampling.
8 State any two merits of systematic sampling.
9 What is cluster sampling?
10 Define ratio estimator.

SECTION - B (25 Marks^

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

11 a Briefly explain random number method of selection of simple random sampling.

OR

b Find the variance of SRSWOR.

12 a List out the advantages of sample survey over census.

OR

b Briefly explain the principles of sample survey.

13 a In stratified sampling given cost function $c = a. + \sum_{i=1}^{k} c_i n_i$ $v(\bar{y}_{st})$ is minimum if $n_i \propto N_i S_i$.

OR

b Compare proportional allocation under stratified sampling with simple random sampling.

14 a Find the variance of estimated mean under systematic sampling.

OR

b Find the relative efficiency of the estimate of the population mean in systematic sampling over SRSWOR.

15 a State the mean and variance of cluster sampling.

OR

b Briefly explain Two-stage sampling with respect to SRS in cluster sampling.

SECTION - C (30 Marks)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 1 0 = 3 0)

16 Describe briefly about non-sampling errors.
17 Obtain the size of the sample in SRS for a specified precision.
18 Compare Neymann's allocation to proportional allocation in stratified random sampling.
19 If the population consists of a linear trend then prove that $v(y_{st}) < v(y_{sys}) < v(y_n)$ R.
20 Obtain the variance of ratio estimator.