PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – **STATISTICS**

BASIC SAMPLING THEORY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 The population consisting of an large number of units is called a _____ population.
(i) Limited (ii) Finite
(iii) Unlimited (iv) Infinite

2 Sampling error can be reduced by
(i) Non –probability sampling (ii) Increasing the population size
(iii) Decreasing the sample size (iv) Increasing the sample size

3 A very important feature of SRSWOR is that the probability of selecting a specified unit of population at any draw is
(i) Equal (ii) Less than
(iii) Greater than (iv) None of the above

4 Sometimes units of the population may be classified namely _____ groups
(i) 2 (ii) 3 (iii) 4 (iv) 5

5 Stratified Sampling comes under the category of:
(i) Unrestricted sampling (ii) Subjective sampling
(iii) Purposive sampling (iv) Restricted sampling

6 Which of the following statement is correct?
(i) Two Way Stratification can also be used
(ii) Two Way Stratification is usually better than one way stratification
(iii) Two Way Stratification is not much used
(iv) All the above

7 Circular systematic sampling is used when _____
(i) N is a multiple of n (ii) N is a whole number
(iii) N is not divisible by n (iv) none of the above

8 In systematic sampling, all _____ parts of the population are well represented
(i) Next (ii) Contiguous
(iii) Continuous (iv) Sample

9 The systematic sampling amounts to the selection of a ____ sampling unit that constitutes the whole sample
(i) Single complex (ii) double complex
(iii) single simple (iv) double simple

10 The value of estimator is called
(i) Estimation (ii) Estimate
(iii) Variance (iv) Constant

Cont...

SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 (a) Explain non-response and its effect in sampling techniques.

(OR)

(b) Distinguish between sampling and non-sampling errors.

12 (a) Write the merits and demerits of Simple random sampling.

(OR)

(b) Show that the sample proportion is an unbiased estimate of the population proportion in simple random sample.

13 (a) Compare simple random sample with stratified random sample and offer your comments.

(OR)

(b) Prove the variance of Pst in stratified random sampling.

14 (a) Obtain the relative efficiency of systematic sampling with respect to simple random sampling.

(OR)

(b) Describe cluster sampling. When it is preferred?

15 (a) Explain the concept of ratio estimator. State the bias of its estimator.

(OR)

(b) Describe Murthy's unordered estimator.

SECTION - C (30 Marks)

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

16 Explain the Variability control in sample surveys.

17 For the same population, calculate S^2 for all simple random samples of size 3 and verify that $E(S^2) = S^2$.

18 In stratified random sampling, explain optimum allocation and Neyman's allocation and state its significance.

19 State and prove the variance of the mean of a systematic sampling method.

20 Define ratio estimator. Obtain the approximate variance of ratio estimator in simple random sampling without replacement.

Z-Z-Z END