

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)  
**BSc DEGREE EXAMINATION DECEMBER 2018**  
(Fourth Semester)

Branch - **STATISTICS**

**BASIC SAMPLING THEORY**

Time : Three Hours

Maximum : 75 Marks

**SECTION-A (20 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks (10 x 2 = 20)

- 1 Define Population and Sample.
- 2 State the need for Sampling.
- 3 Define Simple Random Sampling with replacement.
- 4 What is finite population correction?
- 5 Define stratified random sampling.
- 6 What is optimum allocation?
- 7 State the situations where systematic sampling is useful.
- 8 What is Systematic Sampling?
- 9 Define Cluster Sampling.
- 10 What are Ratio estimates?

**SECTION - B (25 Marks)**

Answer **ALL** Questions

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

- 11 a What is Sample Survey? State its advantages and disadvantages.  
OR  
b Write a note on Sampling and Non-Sampling errors.
- 12 a What is simple random sample? Explain any one of the methods of drawing a simple random sample.  
OR  
b Write the differences between SRWR and SRSWOR.
- 13 a What are the principles of Stratification? Explain.  
OR  
b Obtain an unbiased estimator for population mean using stratified sampling.
- 14 a Show that in systematic sampling with interval 'K' the sample mean is unbiased for the population mean.  
OR  
b Describe the merits and demerits of systematic sampling.
- 15 a Explain the Two stage sampling.  
OR  
b Describe the concept of Ratio estimators.

**SECTION - C (30 Marks)**

Answer any **THREE** Questions

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

- 16 Explain the principal steps in a sample survey.
- 17 Prove that under SRSWOR,  $E(s^2) = S^2$ .
- 18 In stratified random sampling, with usual notations, prove that  $V_{opt} < V_{prop} < V_{ran}$  ignoring fpc terms.
- 19 If linear trend is present, show that systematic sampling is more efficient than simple random sampling.