

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 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 a questionnaire. How does it differ from a schedule?
- 2 Give the difference between sampling error and non-sampling error.
- 3 Define simple random sampling.
- 4 Mention the confident interval for the population mean in simple random sampling.
- 5 When is stratification procedure preferred?
- 6 What is proportional allocation?
- 7 State any two advantages of systematic sampling over stratified sampling.
- 8 Mention the need for estimating variance of statistics.
- 9 Define Regression Estimator.
- 10 Define cluster sampling.

SECTION-B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5x5 = 25)

- 11 a What are the sources of non-sampling error?
OR
b Describe the principal steps in sample survey.
- 12 a How do you draw simple random sampling without replacement from a finite population?
OR
b Show that the simple mean is an unbiased estimate of population mean under simple random sampling without replacement.
- 13 a Briefly explain advantages and disadvantages of stratified Random sampling.
OR
b Obtain the variance of sample mean under stratified random sampling.
- 14 a Prove that the mean of a systematic sample is more precise than the mean of simple random sample if $S_{w<sy}^2 > S^2$.
OR
b If the population consists of linear trend, $Y_j, j = 1, 2, 3, \dots, K$ prove that $V((Y_n)R)$.
- 15 a Explain the method of drawing two-stage cluster sampling with cluster of equal size
OR
b In what situations the cluster sampling is preferred.

SECTION - C (30 Marks)

Answer any THREE Questions

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

- 16 Write the descriptive note on planning large - scale survey.
- 17 Show that S^2 is unbiased for S^2 in simple random sampling without replacement.
- 18 With usual notations prove that $\text{var}(x_{opt}) < \text{var}(x_{pr0}) + p \text{var}(x_r, an)$
- 19 Explain comparison of systematic with stratified Random sampling.
- 20 Obtain the variance of ratio estimator.