B.Sc. DEGREE EXAMINATION, APRIL 2018.

III YEAR VI SEMESTER

Core Major - Paper XIII - SAMPLING TECHNIQUES

Time : 3 Hours Max. Marks : 60

SECTION A – (10 × 1 = 10 marks)

(Q. No. 1-12)Answer any *TEN* questions

1. State the difference between Parameter and Statistic.
2. Define standard error.
3. What is simple random sampling?
4. Prove that SRSWOR sample mean is an unbiased estimate of the population mean.
5. Define Stratified Random Sampling.
6. Name any three allocation schemes used in stratified sampling.
7. Write any two advantage of Systematic Random Sampling.
8. What do you understand by systematic Random sampling?
9. What is ratio estimator?
10. What is PPS Sampling?
11. Define judgment sampling.
12. Justify the need for sampling

SECTION B – (5 × 4 = 20 marks)

(Q. No. 13-19)Answer any *FIVE* questions

1. Compare Sampling with Census.
2. Explain ‘Lottery Method’ of selecting a simple random sample.
3. Prove that $Var(\overbar{y}\_{st})$ is minimum for fixed total size of sample (n) if $n\_{i} ∝ N\_{i} S\_{i}.$
4. Derive mean and variance for Systematic random sampling.
5. Describe Lahiri’s methods of selection and its merits over cumulative method.
6. Explain the limitation of simple random sampling.
7. Distinguish between Sampling and Non-sampling Errors.

SECTION C – (3 × 10 = 30 marks)

(Q. No. 20-24)Answer any *THREE* questions

1. Describe the steps involved in the planning and execution of the sample survey.
2. Prove that the sample mean square is an unbiased estimate of the population mean square in simple random sampling without replacement, i.e.,

$$E(s^{2})= S^{2}$$

1. a) Estimate the population mean and variance in Stratified Random sampling.

b) Compare Proportion allocation vs Simple random sampling.

1. If the population consists of a linear trend, $Y\_{i}=i;i=1,2,3,…, k, $then prove that

$$ V\left(\overbar{y}\_{st}\right)\leq V\left(\overbar{y}\_{sys}\right)\leq V(\overbar{y}\_{n})\_{R}$$

1. Derive the variance of linear regression estimator and compare its performance with ratio estimator.