

Section—A

4 × 5 = 20

1. Explain sampling and non-sampling errors.
2. Describe stratified random sampling.
3. Explain systematic sampling. Mention its advantages and disadvantages.
4. In simple random sampling, show that sample mean \bar{y} is an unbiased estimate of \bar{y} .
5. What do you mean by allocation ? Explain its types.
6. Distinguish between cluster sampling and two stage sampling.
7. Explain regression method of estimation in simple random sampling.

Section—B

10 × 3 = 30

8. (a) Explain by considering a sample size $n = 2$ drawn a population consisting of five numbers 2, 3, 6, 8, 11 that S R S W O R gives a better estimator of population mean than S R S W R.
(b) In simple random sampling with replacement (S R S W R) the variance of sample mean \bar{y} is given by

$$V(\bar{y}) = \frac{N-1}{N} \frac{S^2}{n}$$

9. Find the expression of variance of sample mean and the expression for its estimator in simple random sampling without replacement.
10. Compare the precision of stratified random sampling with proportional allocation and simple random sampling.
11. Find the estimator of population mean and its variance for two-stage sampling with equal first stage units.
12. Explain ratio estimator, compare the ratio estimate with the mean per unit.