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Name :

Reg. No :

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025

(CBCSS-PG)

(Regular/Supplementary/Improvement)

CC19P MST2 C08 / CC22P MST2 C07 - SAMPLING THEORY

(Statistics)

(2019 Admission onwards)

Time: 3 Hours

Maximum: 30 Weightage

Part-A

Answer any *four* questions. Each question carries 2 weightage.

1. Explain the Principles of Sampling Theory.
2. State and prove any two properties of SRS.
3. What is systematic random sampling? State its advantages.
4. Define ratio estimator of population mean. Show that it is not unbiased.
5. Define Horvitz-Thompson estimator.
6. Describe Durbin's πps sampling.
7. Distinguish between sampling and non-sampling errors.

(4 × 2 = 8 Weightage)

Part-B

Answer any *four* questions. Each question carries 3 weightage.

8. Explain Principles of Sampling Theory.
9. Show that in SRSWOR, sample proportion p is an unbiased estimate of population proportion P . Derive its sampling variance.
10. Define ratio estimator. Derive its first approximation to the relative bias of ratio estimator in SRSWOR.
11. Define regression estimator. Compare ratio and regression estimators in stratified sampling.
12. Describe Desraj ordered estimator. Derive Desraj ordered estimator for population mean.
13. Obtain the mean and variance in case of equal cluster sampling.
14. Give any three estimators of population mean in cluster sampling where clusters are of unequal size and discuss their properties.

(4 × 3 = 12 Weightage)

Part-C

Answer any *two* questions. Each question carries 5 weightage.

15. Carry out a comparison between systematic, Stratified and Simple random sampling for a population with linear trend.
16. Give any three estimators of population mean in cluster sampling where clusters are of unequal size and discuss their properties.
17. Carry out the comparison of variances of sample mean under SRS with stratified mean under proportional and optimal allocations.
18. Derive the expression for variance of cluster mean where clusters are of equal size in terms of intra class correlation coefficient and carry out a comparison with simple random sample.

(2 × 5 = 10 Weightage)
