

22P255

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Name:

Reg.No:

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P MST2 C08 / CC22P MST2 C08 - SAMPLING THEORY

(Statistics)

(2019 Admission onwards)

Time : 3 Hours

Maximum : 30 Weightage

Part-A

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

1. Describe about Sampling frame. Explain various defects associated with it.
2. What is Lottery method of sampling?
3. Define linear systematic sampling.
4. Explain equal allocation and proportional allocation in stratified sampling.
5. What is ordered estimator? Give an example.
6. Define Horvitz-Thompson estimator.
7. Write about cluster sampling with unequal clusters. Give an example.

(4 × 2 = 8 Weightage)

Part-B

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

8. Write down the principal steps involved in a sample survey.
9. Show that $var(\bar{y}_{sys}) = \frac{(N-1)[1+(n-1)\rho]S^2}{nN}$, where ρ is the intra-class correlation between the units of the systematic sample?
10. Define ratio estimators. Is it unbiased? Derive the first order expression for its bias.
11. Define regression estimator. Compare ratio and regression estimators in stratified sampling.
12. Define Midzuno-sen scheme of sampling. Obtain the inclusion probabilities for the selection of individual and pairwise units.
13. Discuss the estimation of population mean and variance in case of equal cluster sampling. Also give an estimate of its variance.
14. Explain Multi-Phase Sampling and Multistage Sampling.

(4 × 3 = 12 Weightage)

Part-C

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

15. a) What is simple random sampling?
b) Show that in SRSWOR, sample proportion p is an unbiased estimate of population proportion P .
Derive its sampling variance.
16. Define Stratified sampling. Give an unbiased estimator of the population mean based on a stratified random sample. Obtain its variance.
17. Define ratio estimator. Stating the regularity conditions establish the optimum property of ratio estimator.
18. What is cluster sampling? Discuss the estimation of population mean in case of equal clusters and comparison with SRS.

(2 × 5 = 10 Weightage)
