



M 4457

Reg. No. :

Name :

**V Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.M./B.C.A./B.S.W./
B.A. Afsal-UI-Ulama Degree (CCSS – Reg./Supple./Improv.)
Examination, November 2013
CORE COURSE IN STATISTICS
5 B08 STA : Sampling Techniques**

Time: 3 Hours

Max. Weightage : 30

Instruction : Use of calculator and Statistical Tables permitted.

PART – A

Answer any 10 questions :

(Weightage 1 each)

1. Distinguish between response and non-response bias in sample survey.
2. What is sampling frame ?
3. Distinguish between probability and non-probability sampling.
4. Define simple random sampling.
5. What are the advantages of stratified random sampling ?
6. What is allocation problem in stratified random sampling ?
7. Define linear systematic sampling.
8. What are the advantages of systematic sampling ?
9. In cluster sampling, show that the sample mean is an unbiased estimate of the population mean.
10. What is PPS Sampling ?
11. Write a very brief note on NSSO. **(10×1=10)**

PART – B

Answer any 6 questions :

(Weightage 2 each)

12. Discuss the important sources of sampling errors.
13. Explain any two methods of taking simple random samples.

P.T.O.



14. In SRSWOR, derive the variance of the estimate of the population mean.

15. With usual notation, prove that

$$V(p) = \frac{N-n}{N-1} \frac{PQ}{n}$$

16. Define stratified random sampling. Show that in stratified random sampling,

$$\bar{y}_{st} = \sum_{h=1}^L \frac{N_h}{N} \bar{y}_h \text{ is an unbiased estimate of the population mean.}$$

17. In stratified sampling, find the sample size in each stratum under optimum allocation with fixed sample size.

18. With usual notation prove that

$$V(\bar{y}_{st})_{opt} \leq V(\bar{y}_{st})_{prop}$$

19. Explain the Lahiri's method of taking PPS sample.

20. Write short notes on :

i) Indian Council of Medical Research

ii) Indian Statistical Institute.

(6×2=12)

PART - C

Answer any 2 questions :

(Weightage 4 each)

21. Discuss the important steps in a large scale sample survey.

22. Define linear cost function in sample survey. Obtain the expression for the sample size from each stratum under optimum allocation with fixed linear cost.

23. In systematic sampling, show that

$$V(\bar{y}_{sy}) = \frac{N-1}{N} S^2 - \frac{N-K}{N} S^2_{wsy}.$$

24. In cluster sampling, derive the variance of the population mean in terms of the intra-cluster correlation coefficient.

(2×4=8)