



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – STATISTICS

THIRD SEMESTER – NOVEMBER 2011

ST 3504/ST 3502/ST 4500 - BASIC SAMPLING THEORY

Date : 03-11-2011
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

PART – A

Answer **ALL** the questions

(10x2=20 Marks)

1. Define Sampling unit.
2. Write down the advantages of sampling over census method.
3. Define simple random sampling with replacement.
4. Define unbiased estimator of a parameter.
5. Compare SRSWR with SRSWOR.
6. Briefly explain stratified random sampling.
7. Write any two advantages of stratified sampling.
8. Define Lahiri's method.
9. Define linear systematic sampling.
10. What do you mean by PPS sampling?

PART – B

Answer any **FIVE** questions

(5x8=40 Marks)

11. Discuss briefly the basic principles of a sample survey.
12. Explain "Lottery Method" and "Random Number Table Method" of unit selection.
13. In SRSROR, prove that the sample mean is unbiased estimator of population mean. Also find its variance.
14. In usual notations, prove that the systematic sample mean is more precise than mean of SRSWOR if $S_{wsy}^2 > S^2$.
15. Explain the types of non- sampling errors.
16. A simple random sample of 30 households was drawn from a city area containing 14,848 households. The no. of persons per household in the sample were as follows:

5	6	3	3	2	3	3	3	4	4	3	2	7	4	3
5	4	4	3	3	4	3	3	1	2	4	3	4	2	4

Estimate the total no. of people in the area.

17. Explain the advantages and disadvantages of systematic sampling.
18. Explain cumulative total method of PPS selection.

PART – C

Answer any **TWO** questions

(2x20=40 Marks)

19. Explain how you prepare schedules and questionnaires?
20. Prove that when we compare stratified random sampling with SRS $V(\bar{y})_{ran} \geq V(\bar{y})_{prop} \geq V(\bar{y})_{Neymann}$.
21. (a) Derive the variance of Hansen-Hurtvitz estimator for population total in PPS sampling.
(b) Explain Sampling errors and Non-sampling errors.
22. Write short notes on the following:
 - a) Optimum allocation
 - b) Random group method
 - c) unequal probability sampling
 - d) Inclusion Indicators

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