LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc.DEGREE EXAMINATION –STATISTICS
THIRD SEMESTER – APRIL 2019
16/17UST3MC01– SAMPLING THEORY

Date: 24-04-2019   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

Part – A

Answer ALL the Questions   **10 x 2 = 20 marks**

1. Define Statistic with an example.
2. State any two situations where census method is used.
3. What do you mean by Probability sampling?
4. State any four sampling techniques.
5. Define heterogeneous population.
6. What is meant by stratification?
7. Define sampling interval.
8. When circular systematic sampling method is used?
9. Define Ratio Estimator.
10. Define Regression Estimator.

Part – B

Answer any FIVE Questions   **5 x 8 = 40 marks**

11. Discuss the difference between sampling and census method.
12. Show that, in a SRSWOR, the sample mean is an unbiased estimator of the population mean.
13. Explain about the principal advantages of Stratified Random Sampling.
14. Discuss the concept of Circular systematic sampling technique.
15. Explain about regression estimates when "b" is preassigned.
16. Explain the terms Proportional and Optimal Allocations.
17. Explain about the sampling errors.
18. Discuss about the Bias of the ratio estimate.

Part – C

Answer any TWO Questions   **2 x 20 = 40 marks**

19. a) Explain about the principal steps in sample surveys.
    b) Explain about the non-sampling errors
20. a)Prove that, in SRSWOR, the variance of the sample mean is given by

$$Var(\bar{y}_n) = \left(\frac{N-n}{nN}\right)S^2$$

   b) State the advantages and disadvantages of simple random sampling technique.
21. a) Explain about the procedure of selecting a sample from Stratified Random Sampling.
    b)State the advantages and disadvantages of systematic sampling technique.
22. If the population consists of linear trend, then prove that, $Var\left(\bar{y}\right)_{st} \leq Var\left(\bar{y}\right)_{sys} \leq Var\left(\bar{y}\right)_{ran}$

****