

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



**B.Sc. DEGREE EXAMINATION – STATISTICS**  
**THIRD SEMESTER – NOVEMBER 2019**  
**16/17/18UST3MC01 – SAMPLING THEORY**

Date: 29-10-2019

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

**Part – A**

**Answer ALL the Questions**

**10 x 2 = 20 marks**

1. Define parameter and statistic with an example.
2. Define Census.
3. State the limitations of sampling techniques.
4. Define Non- Probability sampling.
5. Define the term Stratum.
6. What do you mean by equal allocation?
7. Write the formulae for mean and variance of systematic sampling.
8. In what situations systematic sampling is preferred than other methods?
9. Define Regression Estimator.
10. Define Ratio Estimator.

**Part – B**

**Answer any FIVE Questions**

**5 x 8 = 40 marks**

11. Describe about the concept of mean square error.
12. Show that, in a SRSWOR, the sample mean is an unbiased estimator of the population mean.
13. Discuss about the advantages and disadvantages of stratified random sampling technique.
14. Explain the procedure of systematic sampling.
15. Explain about regression estimates when “b” is preassigned.
16. Describe the terms Proportional and Optimal Allocations.
17. Discuss about the Bias of the ratio estimate.
18. Explain about the Non-sampling errors.

**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 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 systematic sampling technique.

21. A) Explain in detail about simple random sampling technique.  
B) Discuss the procedure of Circular systematic sampling.

22. If the population consists of linear trend prove that,  $Var(\bar{y})_{st} \leq Var(\bar{y})_{sys} \leq Var(\bar{y})_{ran}$ .

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