M.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year III Semester
Core Major -VIII
SAMPLE SURVEY DESIGNS

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define simple random sampling without replacement.
2. What is finite population correction?
3. What is stratified random sampling?
4. Define proportional allocation.
5. What is ratio estimation?
6. Write the variance of the ratio estimator in SRSWOR.
7. What is cluster sampling?
8. Define optimum cluster size.
9. Define adaptive sampling.
10. Give the Horwitz-Thompson estimator
11. What is the bias of ratio estimator?
12. When Simmons randomized response model is used?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Describe any one method of selecting a simple random sample from a finite population.
14. Explain how systematic sampling may be viewed as stratified sampling.
15. Obtain the condition for the ratio estimator to be superior to the mean under SRSWOR.
16. Estimate mean and variance of cluster sampling.
17. Discuss snowball sampling.

18. Derive an expression for the variance of the sample mean in stratified sampling.

19. Explain Jackknife ratio estimator.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Show that, in simple random sampling, the sample mean is an unbiased estimate of the population mean and obtain its variance.

21. In stratified random sampling, with usual notations, prove that $\mathbf{V}_{\mathbf{o}pt} \leq \mathbf{V}_{\mathbf{p}rop} \leq \mathbf{V}_{\mathbf{r}an}$ ignoring fpc terms.

22. Show that the ratio estimate is biased. Derive the expression for bias and mean square error of ratio estimate.

23. Explain the sources of non sampling errors.

24. Obtain the variance of estimated mean under SRS in both the stages of cluster sampling.

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