15P254 (Pages:2) Name…………………

Reg.No………………...

SECOND SEMESTER M.Sc. DEGREE EXAMINATION,JULY 2016
(CUCSS - PG)
(Statistics)
CC15PST2C07-SAMPLING THEORY
(2015 Admission)

Time: Three Hours   Maximum:36 Weightage

PART A
(Answer all questions. Weightage 1 for each question)

1. Distinguish between probability sampling and non-probability sampling.
2. Define Simple random sampling.
3. Outline the principle steps in a sample survey.
4. Define a PPS sample.
5. State the conditions under which the ratio estimate is optimum.
6. What is Sen-Midzuno scheme of sampling
7. What do you mean by cluster sampling?
8. What is mean by auxiliary variable? Give an example
9. Which are the two different regression estimators based on a stratified random sample.
10. Define Desraj ordered estimator for the population total
11. What is meant by Circular systematic sampling?
12. Discuss the various factors of non-sampling errors.

(12*1=12 weightage)

PART B
(Answer any *eight* questions. Weightage 2 for each questions)

13. Show that sample mean is the best linear unbiased estimator of population mean in simple random sampling without replacement.
14. Give 95% confidence interval of population proportion based on a simple random sample without replacement of size n taken from a finite population.
15. What do you mean by Murthy's unordered estimator of population parameter?
16. Define ratio estimator of population mean. Show that it is not unbiased but consistent.
17. Show that cluster sampling and stratified random sampling are special cases of two stage sampling.
18. Explain Lahiri's procedure of drawing a PPS sample without replacement.
19. Show that regression estimator of population mean is always better than the simple arithmetic mean estimator.
20. Find an unbiased estimator of population mean square based on cluster sampling where clusters are of equal size..
21. Obtain an unbiased estimator of population mean in two stage sampling.
22. What do you mean by Horvitz-Thompson estimator of population mean? Is it unbiased?

1

23. Show that systematic sampling gives a better estimator than simple random sampling if there is a linear trend among the observations.

24. State and prove the optimum property of ratio estimator of population mean

(8*2=16 weightage)

PART C
(Answer *two* questions. Weightage 4 for each questions)

25. (a) Propose an unbiased estimator of the population total Y and write down its variance under SRSWOR and SRSWR.

    (b) Discuss the estimation of population mean and population variance from a stratified sample.

26. (a) What is cluster sampling? Discuss the estimation of population mean in the case of equal clusters and comparison with SRS.

    (b) Derive an unbiased estimator of population variance based on two stage sampling where first stage units are of equal size.

27. (a) Assume a sample of size 2 is drawn from a population of size 100 according to PPS sampling without replacement. Find Murthy's unordered estimator of population mean corresponding to Des Raj ordered estimator based on this sample.

    (b) Describe any one sampling procedure which gives a non-negative estimate of the variance of Horvitz-Thompson's estimator of population mean as given by Yates and Grundy. Establish your claim.

28. (a) Explain double sampling and elaborate its application in ratio method of estimation.

    (b) Show that mean of first stage unit mean is not an unbiased estimator of population mean in two stage sampling if the first stage units are unequal. Give an unbiased estimator in this case.

(2*4=8 weightage)

****