2019

B.Sc. (Hons.)

4th Semester Examination

STATISTICS

Paper—C8T

Full Marks : 40 Time : 2 Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

1. Answer any *five* out of *eight* questions : 5×2=10

   (a) Distinguish between population and sample.

   (b) Samples of size n are drawn by simple random without replacement sampling procedure from a finite population of size N. Prove that the probability of selecting each population unit at any draw is $\frac{1}{N}$.

   (c) When is ratio method of estimation used in sample survey ?

   (d) Give two advantges of sample survey over complete enumeration.

(e) What is two stage sampling ?

(f) What are the sources of non-sampling errors ?

(g) Define Neyman's optimum allocation in stratified random sampling.

(h) Define 'Consumer Price Index'.

2. Answer any *four* out of *six* questions : 5×4=20

(a) Distinguish between cluster sampling and stratified random sampling.

(b) Discuss when the ratio estimator is better than the usual unbiased estimator of the population mean.

(c) Discuss the situation when double sampling technique is appropriate.

(d) Distinguish between linear systematic sampling and circular systematic sampling. Explain with an example.

(e) For two stage sampling with simple random without replacement sampling at both the stages, obtain an unbiased estimator of the population total assuming that the first stage units are of equal sizes.

(f) Distingush between sampling errors and non-sampling errors.

3. Answer any *one* out of *two* questions : $10 \times 1 = 10$

(a) Derive approximate expressions for the mean square errors of the ratio and regression estimators of a finite population mean under simple random without replacement sampling. Under what conditions these two will be equal ? 4+4+2

(b) (i) Prove that with usual notations : 8

$$V_{opt.} \leq V_{Prop.} \leq V_{rand.}$$

(ii) State two functions of CSO and NSSO each. 2
