



**2020/TDC(CBCS)/ODD/SEM/
STSHCC-302T/113**

**TDC (CBCS) Odd Semester Exam., 2020
held in March, 2021**

**STATISTICS
(3rd Semester)**

Course No.: STSHCC-302T

(Survey Sampling and Indian Official Statistics)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

SECTION—A

1. Answer any ten of the following questions :

$2 \times 10 = 20$

- (a) What do you mean by complete enumeration? Cite some situations where complete enumeration is impracticable.



((3))

- (b) Distinguish between probability sampling and non-probability sampling.
- (c) Name some probability sampling designs.
- (d) What is sampling error? Mention some sources of sampling error.
- (e) Explain the purpose of stratification in sampling design. Point out the problems in stratification.
- (f) Discuss about two advantages of stratified random sampling.
- (g) What are the different ways of allocation of sample size to different strata?
- (h) What is pilot survey? What is its purpose?
- (i) Explain briefly cluster sampling technique.
- (j) If a population consists of a linear trend, then write the relationship between variance of mean of stratified random sampling, systematic sampling and simple random sampling without replacement.
- (k) Write the advantages of systematic sampling technique.

- (l) Write a short note on double sampling. 3
- (m) What is ratio method of estimation?
- (n) Write the purpose of PPS sampling.
- (o) Find the ratio estimator of population total for simple random sample of large size.
- (p) What are the methods used for selection of PPS sample?
- (q) Name some principal publications on industry in India.
- (r) Mention the year of establishment of CSO, National Statistical Commission and NSSO.
- (s) Discuss about the functions of CSO.
- (t) Mention some methods of collection of official statistics.

SECTION—B

Answer any five questions

2. (a) Discuss about the advantages of sampling over complete enumeration. 3
- (b) Show that in simple random sampling, the sample mean is an unbiased estimator of population mean. 3



(4)

3. (a) Show that in SRSWOR, the variance of sample mean is

$$V(\bar{y}_n) = \left(\frac{1}{n} - \frac{1}{N} \right) S^2$$

Symbols have their usual meanings.

- (b) Mention some sources of non-sampling error.

4. (a) Prove that $\text{var}(\bar{y}_{st})$ is minimum for fixed sample size n if $n_i \propto N_i S_i$

(b) Obtain the criterion of proportional allocation of sample size. Hence obtain $V(\bar{y}_{st})$ under proportional allocation.

5. Prove that

$$V(\bar{y}_n)_R \geq V(\bar{y}_{st})_P \geq V(\bar{y}_{st})_{Ny}$$

where symbols have their usual meanings.

6. (a) What do you mean by systematic sampling procedure where $N = n \times k$?

(b) Obtain variance of estimate of population mean in systematic sampling.

7. (a) Compare variance of estimate of population mean based on SRSWOR and systematic sampling.

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(Continued)

(5)

- (b) Distinguish between multistage and multiphase sampling.

8. What is regression method of estimation? Obtain linear regression estimate of population mean and population total with preassigned value of regression coefficient.

9. Discuss the ratio method of estimation of population mean and hence obtain standard error of the estimate.

10. Discuss about the methods of collection of official statistics in India along with their reliability and limitations.

11. (a) Write briefly about NSSO mentioning its functions.

(b) Write a short note on National Statistical Commission.

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