



**2019/TDC/ODD/SEM/
STSHCC-302T/118**

TDC (CBCS) Odd Semester Exam., 2019

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*

Answer **all** questions

UNIT—I

1. Answer any *two* of the following questions :

2×2=4

(a) Distinguish between complete enumeration and sample survey.

(b) What do you mean by probability sampling? Name some probability sampling designs.

(c) Explain simple random sampling with and without replacement.



(2)

2. Answer either [(a) and (b)] or [(c) and (d)] :

(a) Discuss about basic principles of sample survey. 3

(b) Prove that in simple random sampling without replacement, the sample mean is an unbiased estimator of population mean. 3

(c) Explain the different sources of sampling error. 3

(d) Obtain estimated variance of estimator of population mean in simple random sampling with replacement. 3

UNIT—II

3. Answer any two of the following questions :

2×2=4

(a) What do you mean by stratification? Mention two problems of stratification in survey design.

(b) Write a short note on pilot survey.

(c) Define proportional allocation of sample size.

(3)

4. Answer either (a) or (b) :

(a) Show that $V(\bar{y}_{st})$ is minimum for fixed total sample size (n), if $n_i \propto N_i S_i$. What is the name of such type of allocation of sample size? 5+1=6

(b) Compare the variance of estimator of population mean in stratified random sampling with proportional allocation and in unstratified simple random sampling. Hence draw your conclusion. 5+1=6

UNIT—III

5. Answer any two of the following questions :

2×2=4

(a) Explain the concept of cluster sampling.

(b) What is systematic sampling?

(c) Mention one merit and one demerit of systematic sampling.

6. Answer either (a) or (b) :

(a) Obtain variance of estimated mean in systematic sampling. Compare this variance with that of simple random sampling without replacement. 4+2=6

(b) If the population consists of a linear trend, then prove that

$$V(\bar{y}_{st}) \leq V(\bar{y}_{sys}) \leq V(\bar{y}_n)_R$$

where the symbols have their usual meanings. 6

(4)



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(5)

UNIT—IV

7. Answer any *two* of the following questions :

2×2=4

- (a) What is PPS sampling?
- (b) Find the ratio estimator of population total for simple random sample of large size.
- (c) Write a note on multistage sampling.

8. Answer *either* (a) or (b) :

- (a) Obtain simple regression estimator of population mean and population total in regression method of estimation. Prove that these estimators are unbiased when regression coefficient is a preassigned constant. 4+2=6

- (b) What do you mean by ratio method of estimation? Prove that to the first-order approximation, variance of \hat{R} can be expressed as

$$V(\hat{R}) = \frac{1-f}{n} R^2 [C_x^2 + C_y^2 - 2PC_x C_y]$$

symbols have their usual meanings. 2+4=6

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(Continued)

UNIT—V

9. Answer any *two* of the following questions :

2×2=4

- (a) Write the full forms of MoSPI, CSO and NSSO.
- (b) What do you mean by official statistics?
- (c) Write a short note on NSSO.

10. Answer *either* (a) or (b) :

- (a) Write briefly about CSO mentioning its functions. 6
- (b) Describe present official statistical system in India. 6

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