

U.G. 5th Semester Examination-2025**STATISTICS****[MAJOR-VII]****Course Code : ST-M-5.2-T****[Theoretical]****(Survey Sampling and Official Statistics)****[NEP-2020]**

Full Marks : 50(40+10)

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.**Notations and symbols have their usual meaning.*

1. Answer any five questions: $2 \times 5 = 10$
 - a). Define *non-sampling error* and mention two of its sources.
 - b). Distinguish between SRSWR and SRSWOR.
 - c). Write expressions for the unbiased estimator of the population mean and its standard error under SRSWR.
 - d). What is optimum allocation in stratified sampling?
 - e). What is pilot survey?

[Turn over]

- f) What is cluster sampling?
- g) Write down different divisions of NSSO.
- h) State the role of the National Statistical Commission (NSC) in the Indian statistical system.

2. Answer any two questions: $5 \times 2 = 10$

- a) Under SRSWOR, derive the variance of the unbiased estimator of the population mean.
- b) For a stratified sampling, find an unbiased estimator of the population mean. Find its variance.
- c) Write a short note on Ratio estimator.
- d) Discuss the functions and activities of the National Sample Survey Office (NSSO).

3. Answer any two questions: $10 \times 2 = 20$

- a) Describe proportional allocation and optimum allocation. Discuss how you would find the conditions of optimum allocation in case of (i) fixed total sample size, and (ii) given cost function. $2+4+4$

- b) Describe systematic sampling. Under this sampling procedure, how do you estimate the population mean? Derive its variance, compare it with that of SRSWOR and comment on it. $2+2+6$

- c) i) Derive the gain in precision of stratified sampling over SRS.

- ii) Briefly describe the regression method of estimation in sample survey. $6+4$

- d) i) Discuss different types of errors in sample survey.

- ii) Describe the structure of the official statistical system in India, highlighting the roles of MoSPI, CSO, and NSC. $4+6$

[Internal Assessment:10]