



PAT-003-1172004

Seat No. _____

M. Sc. (Statistics) (Sem. II) (CBCS) Examination

August / September - 2020

MS-204 : Sampling Techniques

Faculty Code : 003

Subject Code : 1172004

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Answer the following questions : (Any seven) 14

- (1) Write limitation of Stratified Random Sampling.
- (2) Write merits of Simple Random Sampling.
- (3) Define Multistage Sampling.
- (4) Define Stratified sampling.
- (5) Define Parameter and Statistics.
- (6) In what situation sampling inevitable ?
- (7) Define the formula for estimating mean of sample size.
- (8) Write the characteristic of a good sample.
- (9) Define Population.
- (10) Define Sample and Sample size.

2 Answer the following questions : (any two) 14

- (1) For studying a variable characteristic of the population, observations are 17, 14, 15, 16, 18. How many different sample of size 3 can be taken from this population without replacement ? Verify that the mean of the sample means is equal to the population mean also find the variance as sample mean.
- (2) Write the difference between population study and sample study.
- (3) Write short note on different sampling methods.

3 Answer the following questions : **14**

- (1) Explain Cluster sampling with example.
- (2) Explain Lahiri's method for selection of PPS sample with example.

OR

3 Answer the following questions : **14**

- (1) Explain Two stage sampling in brief.
- (2) Comparison of regression estimator with SRSWOR and Ratio estimator.

4 Answer the following questions : **14**

- (1) Explain Double sampling for unbiased ratio estimator.
- (2) Why double sampling is used or necessary? Also write non-sampling error.

5 Answer the following questions : (any two) **14**

- (1) Prove that : $E(\overline{Y_{nm}}) = \bar{Y}$ and

$$V(\overline{Y_{nm}}) = \left(\frac{1}{n} - \frac{1}{N}\right) S_b^2 + \frac{1}{n} \left(\frac{1}{m} - \frac{1}{M}\right) \bar{S}_w^2$$

- (2) Explain Murthy's unordered estimator method.
- (3) Find out the $\overline{y_{st}}$ and $V(\overline{y_{st}})$ from the following data :

$$N_1 = 120 \quad \overline{y_1} = 42 \quad S_1^2 = 60 \quad n_1 = 12$$

$$N_2 = 100 \quad \overline{y_2} = 45 \quad S_2^2 = 50 \quad n_2 = 10$$

$$N_3 = 80 \quad \overline{y_3} = 50 \quad S_3^2 = 70 \quad n_3 = 10$$

- (4) Prove the Central Limit Theorem.