TB214200W **Reg. No :.....**

Name :.....

B.Sc. DEGREE (C.B.C.S.) EXAMINATION, MARCH 2023

(2021 Admissions Regular, 2020 Admissions Supplementary / Improvement, 2019 &2018 Admissions Supplementary)

SEMESTER IV - CORE COURSE (COMPUTER APPLICATIONS (TRIPLE MAIN))

ST4B05B18 - SAMPLE SURVEY AND DESIGN OF EXPERIMENTS

Time : 3 Hours **Maximum Marks : 80**

Part A

I. Answer any Ten questions. Each question carries 2 marks **(10x2=20)**

1. Write down the expression for the variance of the estimate of the population total in SRSWOR.
2. What is meant by Probability sampling?
3. Write down the expression for the variance of the estimate of the population total in SRSWR.
4. Write the advantages of stratified sampling.
5. Define systematic sampling.
6. Define stratified sampling.
7. Write the two way classification data table.
8. Define linear estimate.
9. Write a short note on randomization.
10. Define estimability of a linear parametric function.
11. Write the linear model for RBD.
12. What is the use of Missing plot techniques?

Part B

II. Answer any Six questions. Each question carries 5 marks **(6x5=30)**

13. Prove that probability of a specified unit of the population being selected at any given draw is equal to the probability of it being selected at the first draw.
14. Write the differences between sampling and non-sampling errors.
15. Derive the unbiased estimator for the population total for SRSWR.
16. Derive the variance of estimator of equal allocation.
17. Derive the variance of the estimate of optimum allocation subject to fixed variance.
18. Explain Best Linear Unbiased Estimator in Detail.
19. Explain random error and its distribution in ANOVA.
20. Differentiate between LSD and CRD.
21. Differentiate between RBD and LSD.

Part C

III. Answer any Two questions. Each question carries 15 marks **(2x15=30)**

22. Show that $V\left(\overline{y_n}\right)_{SRSWOR} \leq V\left(\overline{y_n}\right)_{SRSWR}$.

23. Show that for SRSWOR, $V\left(\overline{y}_{st}\right) = \sum_{h=1}^{k} \frac{w_h^2 s_h^2}{n_h} - \frac{1}{N}\sum_{h=1}^{k} w_h s_h^2$, where $w_h = \frac{N_h}{N}$.

24. Explain ANOVA with linear model of one way classification and its table.
25. Explain the analysis of LSD and obtain the ANOVA table.