TB244764E

Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, MARCH 2024

2022 ADMISSIONS REGULAR

SEMESTER IV -B.Sc. Computer Applications (Triple Main) CORE COURSE (STATISTICS)

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 mean in SRSWOR.
2. Write down the expression for the variance of the estimate of the population total in SRSWR.
3. Differentiate between SRSWR and SRSWOR.
4. Write down the expression for relative gain in precision of optimum allocation over proportional allocation.
5. Define systematic sampling.
6. Define strata in stratified sampling.
7. Write a short note on randomization.
8. Define estimability of a linear parametric function.
9. Define linear estimate.
10. What is local control in experimentation?
11. Write the linear model for ANOVA for CRD.
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 principle steps in sample survey.
15. Distinguish between census and sampling.
16. Derive the variance of the estimate of optimum allocation subject to fixed variance.
17. Compare the variances of the estimates of optimum allocation and proportional allocation.
18. Explain the concept of experimentation.
19. Explain stochastic linear model.
20. Differentiate between RBD and LSD.
21. In an LSD, one observation is missing, obtain the formula to estimate it.

Part C

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

22. Derive the estimate of standard error of the estimate of population mean for SRSWR.
23. Derive any two ways of optimum allocation and derive its variance.
24. Explain ANOVA with linear model of one way classification and its table.
25. Explain the various steps for the analysis of an RBD with v treatments and b blocks with one observation per experimental unit. Assume y_{ij} is the observation which receives j^{th} treatment in i^{th} block.