

B. Sc. DEGREE END SEMESTER EXAMINATION : MARCH 2023**SEMESTER 4 : STATISTICS FOR COMPUTER APPLICATION****COURSE : 19U4CRCST05: SAMPLE SURVEY ANALYSIS AND DESIGN OF EXPERIMENTS***(For Regular - 2021 Admission and Improvement / Supplementary - 2020 / 2019 Admissions)*

Time : Three Hours

Max. Marks: 75

(Use of Scientific calculator and statistical tables are permitted)**PART A****(Each Question carries 1 mark. Maximum marks from this part is 10)**

1. What is the gain in precision of proportional allocation over SRS?
2. Define purposive sampling?
3. In CRD with 5 treatments, each replicated 4 times, degrees of freedom of the error sum of squares is?
4. In CRD with four treatments, each replicated 5 times, degrees of freedom of the error sum of squares is?
5. An ANOVA procedure is applied to data obtained from 5 samples, where each sample contains 9 observations. The degrees of freedom for the critical value of F are?
6. What is precision?
7. What is the basic purpose of ANOVA?
8. What is census?
9. What is the model used in one way classified data?
10. Mention one disadvantage of quota sample.
11. What is relative precision of proportional allocation over SRS?
12. In an LSD with 4 treatments, the degrees of freedom for error will be?

PART B**(Each question carries 3 marks. Maximum marks from this part is 15)**

13. Mention any four advantages of sampling over census.
14. Write ANOVA table for one way classification.
15. For a KxK LSD, how many latin squares can be generated?
16. Write the confidence limit for population total in stratified sampling.
17. Explain random number table method for the selection of random samples.
18. For LSD with error degrees of freedom 12, the number of treatments would be?
19. What are the assumptions in ANOVA?

PART C**(Each question carries 5 marks. Maximum marks from this part is 20)**

20. Explain CRD?
21. In stratified sampling, derive the expression for the number of units to be chosen from different strata according to Neyman allocation.
22. Obtain the expression for the expectation of mean sum of squares due to error for CRD.

23. Analyse the variance in the following latin square of yields (in Kgs) of paddy, where A,B,C,D denotes the different methods of cultivation.
- | | | | |
|--------|--------|--------|--------|
| D(122) | A(121) | C(123) | B(122) |
| B(124) | C(123) | A(122) | D(125) |
| A(120) | B(119) | D(120) | C(121) |
| C(122) | D(123) | B(121) | A(122) |
- Examine whether the different methods of cultivation have given significantly different yields.
24. What is random sample ? Describe two methods of simple random sampling?
25. Derive the expression for variance in proportional allocation.

PART D

(Each question carries 10 marks. Maximum marks from this part is 30)

26. Students were given different drug treatments before revising for the exam. Some were given a memory drug, some a placebo drug and some no treatment. The exam scores are shown below for the three different groups.

Memory drug	Placebo drug	No treatment.
70	37	3
77	43	10
83	50	17
90	57	23
97	63	30

Construct the one way ANOVA table for the data.

27. Derive the expression for variance of the estimator of population mean under proportional allocation and Neyman allocation.
28. Four methods of blending penicillin were compared in a randomised block design. The blocks are blends of raw materials. Construct the ANOVA table. Are there differences between the methods? Use 5 % level of significance.

BLEND	METHOD			
	A	B	C	D
1	89	88	97	94
2	84	77	92	79
3	81	87	87	85
4	87	92	89	84
5	79	81	80	88

29. What is SRS? Derive the variance for SRSWR and SRSWOR.