



25047358

QP CODE: 25047358

Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2025

Third Semester

M Sc BIOSTATISTICS

Core Course - ST020301 - DESIGNS AND ANALYSIS OF EXPERIMENTS

2019 ADMISSION ONWARDS

59B925BB

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What do you mean by ANOVA in experimental data?
2. What is the role of randomization in the process of experimentation.
3. Assume that one observation is missing in RBD. Then what are the modifications need to be applied in the analysis?
4. Suppose that two observations are missing in RBD data, then what is the equation for estimating that missing data?
5. Suppose two observations missing in LSD give the formula for calculating the adjusted treatment sum of squares and adjusted error sum of squares
6. Define incomplete block designs with an example.
7. What is the statistical model used in split plot design.
8. Write a short note on factorial experiment.
9. In a factorial experiment Suppose there are three treatments say A B and C with two levels. Write down its possible treatment combinations.
10. What do you mean by total confounding?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. 1. What is the condition for estimability.





2. y_1, y_2, y_3, y_4 are four random observations with common variance

σ^2 . $E(y_1) = E(y_3) = \theta_1 + \theta_2$, $E(y_2) = E(y_4) = \theta_1 + \theta_3$. show that $(2\theta_1 + \theta_2 + \theta_3)$ is estimable.

12. Explain one-way ANOVA with an example.

13. Find treatment sum of squares and block sum of squares for the following data.

| | Treatment 1 | Treatment 2 | Treatment 3 |
|---------|-------------|-------------|-------------|
| Block 1 | 100 | 112 | 89 |
| Block 2 | 109 | 106 | 113 |
| Block 3 | 110 | 96 | 101 |

14. Differentiate between randomized block designs and latin square design.

15. Develop the ANOVA for hierarchical designs.

16. Outline the analysis of variance with the one concomitant variable.

17. What is meant by confounding?

18. Explain the design of 2^n factorial experiments.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Explain the design of CRD with the help of an example. Also describe the statistical analysis of this design.

20. Explain the design of RBD with the help of an example and describe the statistical analysis of this design.

21. Explain in details (i) BIBD (ii) PBIBD.

22. Describe the design and analysis of 2^n factorial experiment and 3^n factorial experiment.

(2×5=10 weightage)

