ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU -27
B.Sc– 6th SEMESTER
SEMESTER EXAMINATION: APRIL 2024
(Examination conducted in May /June 2024)
ST6123: ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS

(For current batch students only)

This paper contains TWO printed pages and THREE parts

PART-A

I.   Answer any FIVE of the following.   3*5 = 15

1. Give a brief overview of the principles of experiments of design..
2. Describe i) Uniformity Trials ii) Experimental Error iii) Experimental Units.
3. Write the model of two way ANOVA and describe the various notations used.
4. Differentiate between fixed and random effect models.
5. Derive the formula to compute the missing plot in RBD.
6. Give a brief overview of how the three principles are used in Latin Square design.
7. Define confounding with an example. Identify the confounded effect for the below given block

abc	ab	c	1
a	b	ac	Bc

PART- B

II.   Answer any FIVE of the following.   5*5 = 25

8. i) You are conducting a clinical trial on the effectiveness of a drug in a hospital.
      Briefly state how you would go about conducting the experiment.   (2.5)
    ii) Define Tuckey's test and the need for the same.   (2.5)

9. Stating assumptions of ANOVA, partition the sum of squares for one way ANOVA along with the ANOVA table.

10. Derive the least squares estimators of two way ANOVA.

11. Derive the efficiency of LSD over CRD.

12. Explain how the basic principles are used in RBD and provide advantages and disadvantages of the same.

13. Draw the layout of LSD and derive the formula to calculate the missing value when one is missing.

14. Write the procedure to compute the sum of squares for 2^3 design using Yates Method.

PART - C

III.   Answer any TWO of the following.   2*10 = 20

15. Outline the analysis of RBD.
16. i) Explain the need for a factorial design and confounding in factorial design with an
    example   (5)
    ii) Draw the ANOVA table for a 2^3 factorial design and explain the various
    components in it.   (5)

17. i) Derive the efficiency of LSD over RBD.   (5)
    ii) Give the procedure to conduct the analysis of variance in case of factorial
    experiments with partial confounded effects.   (5)

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