PSG COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023

(Second Semester)

Branch – **STATISTICS**

LINEAR MODELS AND DESIGN OF EXPERIMENTS

TIME: 3 HOURS   MAX: 50 MARKS

Section – A (5 Marks)

Answer **ALL** Questions

ALL Questions carry **EQUAL** marks   (5 x 1 = 5)

1. The best linear unbiased estimator is obtained using _____

    (i) Gauss Markov Theorem   (ii) Fisher's inequality

    (iii) both   (iv) none of the above

2. Randomization in an experiment helps to eliminate

    (i) systematic influence   (ii) human biases

    (iii) dependence among observations   (iv) all the above

3. If different effects are confounded in different blocks, it is said to be

    (i) complete confounding   (ii) Partial confounding

    (iii) balanced confounding   (iv) none of the above

4. Efficiency of BIBD is _____ RBD.

    (i) greater than   (ii) lesser than   (iii) equal to   (iv)none of the above

5. Cross-over design is suitable for measuring:

    (i) direct treatment effect   (ii) treatments residual effect

    (iii) both (a) and (b)   (iv) neither (i) nor (ii)

Section – B(15 Marks)

Answer **ALL** Questions

ALL Questions carry **EQUAL** marks   (5 x 3 = 15)

6. (a) Explain the testing of linear hypothesis.

    OR

    (b) Describe Best linear unbiased estimator(BLUE).

7. (a) Explain how you would analyse a randomized block design.

    OR

    (b) Explain the efficiency of LSD over RBD with suitable application.

8. (a) Present the analysis of 2^3 partial confounding in factorial design with example.

    OR

    (b) Discuss the analysis of partial confounding in 3^2 factorial design.

9. (a) Describe about balanced incomplete block designs.

    OR

    (b) Illustrate Lattice design with example.

10. (a) Explain Design for Bio-assays.

    OR

    (b) Discuss about Weighing design.

Section - C (30 Marks)
Answer **ALL** Questions
ALL Questions carry **EQUAL** marks   (5 x 6 = 30)

11. (a)   State and prove Gauss –Markov Theorem.
                OR
    (b)   Explain the analysis of non-orthogonal data with illustration.

12. (a)   Discuss the advantages of a Latin square design.
                OR
    (b)   Explain the components of the completely randomized design with an example.

13. (a)   Discuss the analysis of Total confounding in 3^3 factorial design.
                OR
    (b)   Explain simple effect in a 2^n factorial experiment.

14. (a)   Discuss the analysis of partially balanced incomplete block designs with 2 associate classes.
                OR
    (b)   Explain the parametric conditions of a PBIBD.

15. (a)   Describe the analysis of Parallel line assays with its inference.
                OR
    (b)   Bring out the analysis of Cross-over design with an example.

Z-Z-Z   END