

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(Fourth Semester)

Branch – STATISTICS

LINEAR MODELS AND DESIGN OF EXPERIMENTS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. If $b_1\lambda_1 + \dots + b_k\lambda_k = 0$
 - (i) correlated
 - (ii) dependent
 - (iii) λ_i 's are linearly independent
 - (iv) linearly dependent
2. When m set of values are given, maximum number of mutually orthogonal constraints are
 - (i) $m-1$
 - (ii) $m+1$
 - (iii) $n-1$
 - (iv) $m+n$
3. 3^2 factorial experiment with r replication the error degrees of freedom is
 - (i) $9(r-1)$
 - (ii) $8(r-1)$
 - (iii) $6(r-1)$
 - (iv) qr
4. In, BIBD the parameter which satisfy the relation?
 - (i) $vb=kr$
 - (ii) $k\lambda=rv$
 - (iii) $(r-1)\lambda = (k-1)v$
 - (iv) $\lambda(v-1) = r(k-1)$.
5. The potency of the test parameter is smaller than that of the standard population if
 - (i) $\rho < 1$
 - (ii) $\rho > 1$
 - (iii) $\rho \neq 1$
 - (iv) $\rho = 1$

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) What is BLUE and give a model?
OR
b) Write a note on non orthogonal data and give example.
7. a) Discuss about local control.
OR
b) Draw a lay out of 4X4 Graeco –Latin square design and explain.
8. a) What is 2^2 factorial experiment and explain with an example?
OR
b) Differentiate partial and complete confounding design.
9. a) Give an example for BIBD.
OR
b) Write a note on Youden square design.
10. a) What is meant by Bio-assays? Differentiate standard and test preparation.
OR
b) Explain Cross –over design and its uses.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

11. a) Describe the linear model and its estimable linear parametric functions.
OR
b) Elucidate the statistical analysis of mixed plot techniques.
12. a) Explain the analysis of variance of $k \times k$ Latin square design and mention its efficiency with related to RBD.
OR
b) Illustrate the ANACOVA technique in CRD.
13. a) Derive the Statistical Analyse the 3^2 factorial experiment with illustration.
OR
b) Construct 2^3 factorial experiment with higher order interaction is completely confounding.
14. a) Discuss the analysis of BIBD with incidence matrix.
OR
b) Illustrate P.B.I.B design and its parametric relations.
15. a) Describe the indirect Bio-assays with analysis of variance for testing the linearity.
OR
b) Explain the concept of Linear Response Surface Design.

Z-Z-Z

END