



NP – 239

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VI Semester B.Sc. Examination, July/August 2024

(NEP)

STATISTICS

STS 601 : Analysis of Variance and Design of Experiments

Time : 2½ Hours

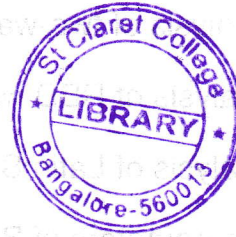
Max. Marks : 60

Instructions : i) Scientific calculators are **permitted**.

ii) **Statistical** tables and **graph** sheets are provided on request.

PART – A

Answer **any four** questions (2 marks **each**).



(4×2=8)

1. Define ANOVA and mention its assumptions.
2. What do you mean by mixed effect model ?
3. Define the term experiment.
4. Provide the mathematical linear model for two-way ANOVA with usual notations.
5. Define BIBD.
6. What do you mean by complete confounding ?

PART – B

Answer **any four** questions (5 marks **each**) :

(4×5=20)

7. Explain :
 - i) Random effect model.
 - ii) Fixed effect model.
8. Provide the estimates of parameters of CRD mathematical model, using least squares method.

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9. Deduce the sum of squares of RBD using partitioning method.
10. Explain the main and interaction effects in 2^2 factorial experiment.
11. Explain the Yate's method of computing factorial effect totals.
12. Explain the procedure of analysis of 2^2 factorial experiment using Yate's method.

PART – C

Answer **any four** questions (8 marks **each**) : (4×8=32)

13. Provide the analysis of two-way classification without interaction. 8
14. Explain the analysis of RBD with single missing observation. 8
15. Explain the analysis of Latin Square Design (LSD). 8
16. a) Define the parameters of BIBD and incidence matrix.
b) Prove that $\lambda(t - 1) = r(k - 1)$. (4+4)
17. Explain the procedure of analysis of 2^3 factorial experiment. 8
18. Provide the analysis of 2^2 factorial experiment by assuming a complete confounding in r-replicates. 8