



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc., DEGREE EXAMINATION – STATISTICS

SIXTH SEMESTER – NOVEMBER 2013

ST 6603/ST 6600 – DESIGN AND ANALYSIS OF EXPERIMENTS

Date : 11/11/2013
Time : 1:00 - 4:00

Dept. No.

Max. : 100 Marks

PART - A

Answer **ALL** the questions:

(10 x 2 = 20)

1. Give the sum of squares of the contrast $C_1 = X_1 + 2X_2 - X_3$ when $n=8$ and the number of components is 3.
2. Mention the use of Duncan's multiple range test.
3. State Cochran's theorem.
4. Give the skeleton ANOVA table for one way classification.
5. Write down the fixed effect model for one-way classified data.
6. Mention an important limitation of Latin Square designs with reference to error degrees of freedom.
7. Write all possible treatment combinations in a 2^3 factorial design.
8. What is meant by partial confounding?
9. Briefly explain incomplete block design?
10. State the difference between BIBD and PBIBD.

PART - B

Answer any **FIVE** Questions:

(5 x 8 = 40)

11. Explain Scheffe's method for comparing contrasts.
12. Explain the differences between fixed effect and random effect models.
13. Develop ANOVA for one way classified data.
14. Derive the formula for estimating the missing value in a RBD when one observation is missing.
15. Explain the preparation of layout of a Randomised Block Design.
16. Explain the process of computing various factorial effects in the case of a 2^4 design.
17. Explain : (i) Quadratic Effect and (ii) Linear Effect in the case of 3^2 design.
18. Explain various components of the ANOVA table of PBIBD.

(P.T.O)

PART - C

Answer any **TWO** Questions:

(2 x 20 =40)

19. (a) Describe in detail the preparation of layout of a Latin Square Design and the steps involved in its analysis.
(b) Discuss the efficiency of RBD over CRD.
20. (a) Develop the ANOVA for a 2^3 factorial design in which the highest order interaction is confounded.
(b) Briefly describe Yates method of computing various sum of squares in a factorial design.
21. (a) Define : BIBD
(b) Derive the parametric conditions of a BIBD.
(c) Describe the statistical model meant for BIBD (Analysis is not needed).
22. Write short notes on the following:
(a) Partially confounded factorial design
(b) Generalized Effect
(c) Replication
(d) Mixed Effect Models.

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