

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – STATISTICS

SIXTH SEMESTER – APRIL 2010

ST 6600 - DESIGN & ANALYSIS OF EXPERIMENTS

Date & Time: 15/04/2010 / 9:00 - 12:00 Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the questions

(10 x 2 = 20 marks)

1. When do you say two contrasts are *orthogonal*? Give two contrasts which are orthogonal to each other.
2. What do you mean by *random effect models*?
3. Briefly explain the term *analysis of variance*.
4. Give a practical situation wherein one will be interested in performing two way ANOVA.
5. When do we use Duncan's multiple range test?
6. Write down the skeleton anova table corresponding to a Latin Square Design of order 4.
7. What do you mean by *main effect* in 2^n designs?
8. What is meant by *partial confounding*?
9. Mention any one way of developing contrasts defining various effects in 2^n designs.
10. What are incomplete block designs?

PART – B

Answer any FIVE Questions.

(5 x 8 = 40 marks)

11. State Cochran's theorem and describe its use in ANOVA.
12. Give situations where random effect models and mixed effect models are applicable.
13. Describe one-way fixed effect model and obtain the least squares estimates of the parameters involved in such a model.
14. Explain the preparation of layout for randomized block design.
15. Write a descriptive note on *missing plot techniques*.
16. Explain the process of computing various factorial effects in the case of a 2^4 design.
17. Describe the terms '*quadratic effect*' and '*Linear effect*' in the case of 3^2 design.
18. State and prove Fisher's inequality related to BIBD.

(P.T.O)

PART – C

Answer any TWO Questions.

(2 x 20 =40 marks)

19. Develop the complete analysis of two way classified data with several observations per cell.
20. It is decided to confound (partially) all the interactions of order above 2 in 2^4 factorial design. Explain the process of layout preparation and analysis
21. Develop the Intra block analysis of Balanced Incomplete Block Design
22. Write short notes on the following:
 - (a) Mixed Effect Models
 - (b) Latin Squares
 - (c) Construction of BIBD
 - (d) Complete Confounding

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