# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **STATISTICS**

SIXTH SEMESTER – **APRIL 2016**

**ST 6606/ST 6603/ST 6600 – DESIGN AND ANALYSIS OF EXPERIMENTS**

Date: 15-04-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

## PART – A

**Answer ALL questions:** **(10 x 2 = 20 marks)**

1. Define contrasts.
2. Write down the linear model for random effect model.
3. Define ANOVA.
4. Define two way classified data.
5. Give the layout of standard 5 x 5 Latin square design.
6. Define confounding.
7. Define interaction.
8. State two advantages of factorial experiment.
9. Define BIBD.
10. Write any two parametric relationship of BIBD.

## PART – B

**Answer any FIVE questions:** **(5 x 8 = 40 marks)**

11. Explain briefly about the models in experimental design.
12. Discuss the advantages and disadvantages of CRD.
13. Describe the technique of one – way ANOVA and also state its assumptions.
14. Explain main and interaction effects in $3^2$ factorial experiments.
15. Explain briefly about missing plot technique and state the advantages of it.
16. Explain briefly about the partial confounding in $2^3$ factorial experiments.
17. State and prove Fisher's inequality for the parameters of BIBD.
18. Explain the mathematical model of one way classified data.

## PART – C

**Answer any TWO questions:** **(2 x 20 = 40 marks)**

19. a) Discuss briefly about the fundamental principles of experimental design. (12 Marks)

    b) Explain briefly about the linear constraints. (8 Marks)

20. a) Explain briefly about $2^2$ factorial experiments and also derive the analysis of it. (10 Marks)

    b) What is meant by total confounding? Illustrate that in $2^3$ factorial experiments. (10 Marks)

21. a) Bring out the analysis of two way classification with more than one observation per cell and also derive the efficiency of a two way design over one way. (10 Marks)

    b) What is meant by intra block analysis? Derive the intra block analysis of BIBD. (10 Marks)

22. Derive the complete statistical analysis of LSD.

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