LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – STATISTICS

FOURTH SEMESTER – APRIL 2014

ST 4813 - APPLIED EXPERIMENTAL DESIGN

Date : 27/03/2014   Dept. No.   Max. : 100 Marks
Time : 01:00-04:00

SECTION – A

Answer all the questions   (10 x 2 = 20 marks)

1. State the various models used in design of experiments.

2. Give any two applications of experimental designs in Phama industry.

3. Briefly explain the term critical difference.

4. Define the efficiency of a design.

5. Define whole plot treatments.

6. Construct two 3x3 repeated L.S.D ?

7. List all the treatment combinations of 3^2 factorial design.

8. Define a resolvable BIBD with an example .

9. What is meant by Aliasis ?

10. State the parameters of second kind   for a PBIBD.

SECTION-B

Answer any Five questions   (5 x 8 = 40 marks)

11. Explain in detail all the principles of experimental design with an example.

12. Discuss the efficiency of RBD over CRD.

13. List all the independent and generalized treatment combinations confounded in 2^7 factorial design of size 2^3 in a single replication.

14. Describe, the analysis of variance for a 3^3 factorial design, stating all the hypothesis, ANOVA and conclusions.

15. Explain half fractional factorial design with suitable illustration.

16. Describe, the analysis of variance for a 2^4 factorial design, stating all the hypothesis, ANOVA and conclusions.

17. Construct MOLS when $G (F) = p^n$ when p = 7 and n = 1.

18. Construct a Lattice square design when the number of treatment is nine.

SECTION-C

<u>Answer any Two questions</u>   (2 x 20 = 40 marks)

19a. Describe, the analysis of variance for RLSD, stating all the hypothesis, anova and conclusions.

   b. Explain missing plot technique in RBD with an example.   (12+8 Marks)

20a. Derive the block contents for BCD in 2^4 factorial design using homogeneous equations.

   b. Define the term key block in the case of 2^5 factorial design of size 2^3 in
      which 2 independent interactions and 1 generalized interaction are Confounded
      Discuss in detail using the required linear equations for the confounded effects.
                                                                (8 +12Marks)

21a. Construct an IBD and hence derive BIBD and PBIBD.
   b. Explain the applications of finite fields. (10 +10 marks)

22 a. Construct an Youden Square using 7X7 LSD.

   b. Construct a PBIBD with three associate classes stating all the parametric conditions
                                                                (8 +12Marks)

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