

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – STATISTICS

FOURTH SEMESTER – APRIL 2010

ST 4809 / 4805 - APPLIED EXPERIMENTAL DESIGN

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

Max. : 100 Marks

SECTION – A

Answer All questions. Each carries 2 marks. (10 x 2 = 20 marks)

1. Explain the concept of Randomization.
2. Give an applied Scenario to the Completely Randomized Design.
3. Explain Balanced Incomplete Block Design.
4. Prove $vr=bk$ for a BIBD where v, b, k, r, λ are the parameters of BIBD.
5. Give an example of a Youden Square Design?
6. Explain the concept of derived BIBD.
7. Construct a residual BIBD.
8. Give an example of constructing a BIBD from an Orthogonal Latin Square Design.
9. What do you mean by orthogonal contrasts?
10. Give an applied scenario of a 2^2 factorial design.

SECTION – B

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

11. Explain the method of estimating one missing observation in RBD.
12. Explain the analysis of two factors with multiple levels factorial design.
13. Prove $b \geq v+k-1$ for a resolvable design.
14. Write down the analysis of 3^2 factorial design.
15. Explain the procedure of confounding in 2 blocks of a 2^3 factorial design confounding highest order interaction.
16. Explain the procedure of partial confounding in 2 blocks of a 2^3 factorial design by confounding any three factors in 3 replicater.
17. Describe the method of constructing a Lattice Square Design.
18. Construct a BIBD with the parameters $v=4, b=6, k=2, r=3, \lambda=1$

SECTION –C

Answer any TWO questions. Each carries 20 marks. (2 x 20 = 40 marks)

19.

- a) Write short note on two stage design by explaining an application. (10 Marks)
- b) Analysis short note on the application of Split Plot Design. (10 Marks)

20.

- a) Explain the procedure of constructing Orthogonal Latin Square Design. (12 Marks)
- b) Explain the practical application of Orthogonal Square Design.(8 Marks)

21.

- a) Explain the Intra Analysis of BIBD. (12 Marks)
- b) Construct a BIBD with parameters $v=s^2$, $b=s(s+1)$, $k=s$, $r=s+1$, $\lambda =1$ (8 Marks)

22.

Construct a 3^2 factorial design by

- a) defining contrast method ? (8 Marks)
- b) Sign table method ? (8 Marks)
- c) Group property method? (4 Marks)
