

5. (a) What is meant by confounding in factorial experiments? Distinguish between partial and total confounding. Construct a system of partial confounding for a 3^2 factorial experiment in blocks of size 3 with 6 blocks so that at least partial information can be obtained about two factor interaction components and full information about the main effects. 9
- (b) Describe Yates algorithm for computing the total effects and the sum of squares due to various effects for a 2^3 factorial experiment laid out in r randomized blocks. 6
6. (a) A 2^5 design is to be arranged in 2^2 blocks of size 2^3 each. Suggest a suitable set of 3 degrees of freedom to be confounded such that information on main effects and first order interactions is not at all lost. Also write down the treatment combinations of all the blocks. 6
- (b) What are fractional factorial designs? Construct a 2^{5-2} design with defining relations $I = ABD$ and $I = -BCDE$. Also, write the alias structure of this design and identify its resolution. 9

[This question paper contains 4 printed pages]

Your Roll No. :

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Name of the Course : B.Sc. (Hons.) Statistics

Name of the Paper : Design of Experiments

Semester : VI

Time : 3 Hours

Maximum Marks : 75

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Attempt **five** questions in all.
- (c) Question **No. 1** is compulsory.
- (d) Attempt **four** questions from the remaining questions.
1. (a) Suppose an experiment with a single factor at five levels was conducted using a CRD. Each level of the factor is randomly assigned three experimental units. Write down the appropriate linear model. How many degrees of freedom are available for estimating the error variance? 3