

QUEEN MARY, UNIVERSITY OF LONDON

MAS 314

Design of Experiments

Assignment 10

For discussion on 20 March 2007

- 1** Construct a 4×4 Graeco-Latin square and a 7×7 Graeco-Latin square.
- 2** A horticultural research station intends to investigate the effects of two treatment factors on the total weight of apples produced from apple trees. One treatment factor is the method of thinning; that is, removing fruitlets at an early stage of development so that those remaining will be able to grow larger. There are five methods of thinning, coded as A, B, C, D, E . The second treatment factor is the type of grass to grow around the base of the tree to prevent the growth of weeds. There are five types of grass, coded as a, b, c, d, e . It is assumed that there is no interaction between method of thinning and type of grass.

There are 25 trees available for the experiment. They are arranged in a 5×5 rectangle. Construct a suitable design.
- 3** A road safety organization wishes to compare four makes of car-tyre. The organization has four test cars and four test drivers. One working day is needed to fit new tyres to a car, take it for an exhaustive test-drive, take relevant measurements on tyre treads, record all details of the test-drive, and prepare the car for the next session. The organization has only one week in which to perform its tests. To keep each car properly balanced, the organization has decided that all four tyres on a car at any one time should be of the same make.

Construct a suitable design for this trial.

Write down the skeleton analysis of variance table, showing stratum, source and degrees of freedom.