

## Assignment 4

### Problem 1

Four chemical compounds A-D are being tested as potential protective fungicides against apple mildew. Twelve plants of same variety of apple seedling are available; these are split into four groups of three, and each group is then dipped into a suspension of one of the compounds A-D. Afterward the whole collection of plants is placed in a closed environment which is infected with mildew spores. The plants are positioned in 3 randomised blocks I,II and III, to take out any effect due to slight systematic variation in the environment, and subsequently the number of lesions of the first leaf on each plant is counted. These records are tabulated below.

Compound

Block	A	B	C	D
I	9	5	8	4
II	4	2	5	4
III	8	3	5	3

**Task 1:** Is there evidence that blocking was necessary? Explain.

**Task 2:** Examine the difference between compounds.

**Task 3:** What would be the effect of the compounds if we were not using any blocking? Why?

### Problem 2

Seedling plants are transplanted from a greenhouse to an outdoor plantation at three different times  $T_1$ ,  $T_2$  and  $T_3$  being given one of four different hormone rooting treatments  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$  when transplanted. Two plants are used for each  $RT$  combination, the layout being completely

randomised. The results are summarised in the following table: the entry 11; 13 for the  $R_1T_1$  combination indicates that one plant grew 10 cm and the other 13 cm in a fixed period of time after transplanting.

	$T_1$	$T_2$	$T_3$
$R_1$	10,12	16,19	24,26
$R_1$	10,17	15,23	19,25
$R_3$	20,18	24,21	26,27
$R_4$	18,23	25,29	30,35

Analyse and comment on these results.

### Problem 3

A supermarket organisation buys in a particular foodstuff from the suppliers A,B,C,D and subjects samples of this to regular tasting tests by expert panels. Various characteristics are scored, and the total score for the product is recorded. Four tasters  $a,b,c,d$  at four sessions (1,2,3,4) obtained the results below. Analyze and comment on these.

#### Taster

Session	a	b	c	d
1	A:21	B:17	C:18	D:20
2	B:20	D:22	A:23	C:19
3	C:20	A:24	D:22	B:19
4	D:22	C:21	B:22	A:26