

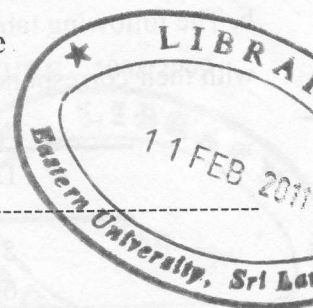
# Eastern University Sri Lanka

## Final Year First Semester Examination in Agriculture 2008 / 2009

### CC 4101 Experimental Techniques in Agriculture

Allowed time : Two hours

Answer all questions.



1. a. What is a factorial experiment?

b. In an experiment seed rates with four levels (S1, S2, S3 and S4) in two varieties (V1 and V2) of chillies were studied. This experiment was designed in a Randomized Complete Block Design with three replicates. The yield (kg / plot) of chillies obtained in this experiment are given below.

Seed Rate	Blocks		
	Variety V1		
	I	II	III
S1	4.20	4.94	4.45
S2	4.36	3.50	4.17
S3	5.40	4.50	5.75
S4	5.15	4.40	3.90
	Variety V2		
S1	2.82	3.14	3.80
S2	3.74	4.43	2.92
S3	4.82	3.90	4.50
S4	4.57	5.32	4.35

- Perform the analysis of variance.
- Interpret your results at 5% significant level.

2. Write short notes on the following:

- Replication and randomization in an experiment.
- Least Significant Difference (LSD) test in mean comparison.
- Advantages and disadvantages of Completely Randomized Design (CRD).

3. a. Define the term "Regression Coefficient".

b. The following table gives measurement of 10 onion bulbs with diameters between 50 – 70 mm with their corresponding weights in grams.

Diameter (X)	Weight (Y)
51.0	63.4
66.2	115.3
69.2	146.6
69.5	132.6
56.9	80.7
67.1	125.6
58.1	80.0
53.9	78.7
63.0	112.8
60.0	96.2

$$\sum x = 614.9 \quad \sum x^2 = 38192.17 \quad \sum y = 1031.9 \quad \sum y^2 = 113247.79 \quad \sum xy = 65014.60$$

Using the above data,

- Draw the scatter diagram.
- Find the regression equation.
- Test the significance of regression coefficient.
- Compute the correlation coefficient and comment on the relationship.

4. a. What are the demerits of Latin Square Design (LSD) in agricultural experiments?

b. The following table shows the field layout and yields (kg / plot) of wheat for a 4 x 4 Latin Square Design. A, B, C and D are four varieties.

		Column				
		1	2	3	4	Row Total
Row	1	10.5 (C)	7.7 (D)	12.0 (B)	13.2 (A)	43.4
	2	11.1 (B)	12.0 (A)	10.3 (C)	7.5 (D)	40.9
	3	5.8 (D)	12.2 (C)	11.2 (A)	13.7 (B)	42.9
	4	11.6 (A)	12.3 (B)	5.9 (D)	10.2 (C)	40.0
Column Total		39.0	44.2	39.4	44.6	

$$\sum x^2 = 1837$$

- Perform the ANOVA for the above data set.
- Interpret your results statistically and non – statistically.