

Eastern University, Sri Lanka

Final Year First Semester Examination in Agriculture 2004/2005

CSC 4101 Experimental Techniques in Agriculture

Answer All Questions

Time Allowed: Two Hours

1. A farmer was willing to select a suitable rice variety with correct level of nitrogen application. There were three rice varieties and two levels of nitrogen along with a control. The farmer has awareness on the effect of variety. The yield (t/ha) from each plot are tabulated below.

Nitrogen level (kg/ha)	Block I	Block II	Block III
Variety I			
Control	2.5	3.0	3.2
50	6.5	4.8	5.6
100	8.0	8.2	7.7
Variety II			
Control	3.6	3.6	3.4
50	6.2	7.0	7.4
100	8.7	7.9	8.2
Variety III			
Control	3.1	2.8	2.6
50	6.5	7.2	6.2
100	10.4	9.0	9.2

- a. Recommend a suitable experimental design and draw lay-out for this experiment
- b. Construct the analysis of variance table and examine the effects of both variety and nitrogen factors with their interactions.
- c. Write a short report on your conclusions.

2. The following table gives measurements of 10 onion bulbs with diameters between 50 and 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

$$\Sigma X = 614.9 \quad \Sigma X^2 = 38192.17 \quad \Sigma Y = 1031.9 \quad \Sigma Y^2 = 113247.79 \quad \Sigma XY = 65014.60$$

- Draw a scatter diagram and fit the regression line.
- Calculate the correlation coefficient (r) and comment on the relationship.
- Construct ANOVA table and comment on the results.

3.

- Write short notes on sampling procedure during an experiment.
- Explain the 'problem data' that are commonly faced in an agricultural experiment.

4. Briefly describe the following statements;

- In practice, Latin Square Design is applicable only for experiments in which the number of treatments is not less than 4 and not more than 8.
 - Blocking and ANOCOVA cannot be interchangeable.
 - Factorial experiments are preferred to separate single factor experiments.
 - Correlation analysis explains the degree of association between independent and dependent variables.
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