Eastern University, Sri Lanka

Final Year First Semester Examination in Agriculture 2012/2013 (Mar/Apr 2015)

CC 4101: Experimental Techniques in Agriculture

Answer ALL Questions

Time allowed: 02 hours

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1. A researcher conducted an experiment to test the yield of four paddy varieties (V1, V2, V3 and V4) using Randomized Complete Block Design (RCBD) with five blocks. The recorded grain yield of paddy (kg/plot) is given below.

	Paddy yield (kg/plot)			
Block	V1	V2	V3	V4
1	32.0	33.1	31.1	30.7
2	30.3	30.5	30.1	30.5
3	32.5	34.9	30.5	34.6
4	32.4	33.2	30.3	32.8
5	34.1	32.3	30.9	32.6

   a. Construct the Analysis of Variance (ANOVA) for the above experiment.
   b. Interpret the results at 5% significant level.
   c. Perform the Least Significant Difference (LSD) test for the above data.

2. Write short notes on the following:
   a. Principles of field experimentation.
   b. Mean separation procedures in agricultural experiments.
   c. Randomization in Latin Square Design.

3. A digestion trial was carried out with four shorthorn cattle (C1, C2, C3 and C4), each animal receive each of four rations (A, B, C and D) in four successive periods (P1, P2, P3 and P4), using Latin Square Design. Calculated digestibility of nitrogen were given as follows;

	Period			
Shorthorn cattle	P1	P2	P3	P4
C1	63.3 (D)	68.9 (A)	67.9 (B)	63.4 (C)
C2	66.8 (A)	63.5 (B)	62.3 (C)	62.3 (D)
C3	64.8 (C)	67.2 (D)	69.1 (A)	67.8 (B)
C4	66.1 (B)	68.9 (C)	65.3 (D)	65.3 (A)

a. Perform the ANOVA and interpret the results at 5% significant level.
b. Write the advantages and disadvantages of Latin Square Design in field experiments.
c. Calculate the Coefficient of Variation (CV) for the above experiment.

4. A factorial experiment was conducted to study the effect of spacing and fertilizer on rice yield using Randomized Complete Block Design (RCBD) with three blocks. Three levels of spacing (S1, S2 and S3) and two levels for fertilizer (F1 and F2) were used in the experiment. Yield recorded from the experiment are given below.

	Paddy yield (tons/ha)					
Block	S1F1	S1F2	S2F1	S2F2	S3F1	S3F2
1	3.9	6.6	8.1	7.2	5.2	5.7
2	5.5	5.7	7.6	6.3	3.9	5.3
3	6.4	5.9	6.4	8.1	5.9	5.1

a. Perform the ANOVA for the above experiment.
b. Interpret the results at 5 % significant level.