

KERALA AGRICULTURAL UNIVERSITY

B.Sc. Hons (Ag) 2009 admission

VIth Semester Final Examination, June /July 2012

Cat. No: stat.3203

Marks: 80

Title: Design and Analysis of Experiments

Time: 3hours

I. Fill up the blanks

(10 x 1 = 10)

1. The objects of comparison in an experiment is known as -----
2. The most popular design for laboratory experiments is -----
3. The error degrees of freedom in a Latin Square Design with 6 treatments is ----
4. The standard error of the mean of a treatment with r replications is given by the formula -----
5. The minimum number of degrees of freedom required for the valid estimation of error variance is -----
6. Two directional blocking is adopted in ----- design
7. ----- transformation is used for normalizing a positively skewed distribution
8. The experimental error is controlled using the principle of -----
9. A 3 x 2 x 3 factorial experiment has ----- number of treatment combinations
10. ----- design permits unequal number of replications of treatments

II. Write short notes (any ten)

(10 X 3 = 30)

1. Need for designing experiments
2. Uniformity trials
3. Randomisation and Replication
4. Multiple comparison tests
5. Missing plot techniques
6. Experimental error
7. Main effect and Interaction
8. Analysis of Covariance
9. Confounding
10. Border effects
11. On Farm trials
12. Split-plot design

III. Write short essays (any six)

(6 x 5 = 30)

1. Explain the concept of statistical significance. Give the procedure for testing a statistical hypothesis
2. Explain the terms : (a) Blocking (b) Border effects (c) Critical difference (d) experimental unit

3. What is meant by experimental error ? What are its main sources ? Enumerate the different methods of reducing experimental error.
4. Define factorial experiments. Distinguish between Symmetrical and Asymmetrical Factorial experiments. What are the advantages of factorial experiments over single factor experiments.
5. Give skeleton ANOVA tables (sources of variation and degrees of freedom only) for the following :
 - (a) CRD with five treatments and four replications
 - (b) 5 x 5 Latin square design
 - (c) 2 x 3 x 3 factorial CRD with three replications
6. What is meant by strip-plot design ? How is it different from split-plot design. Explain the situations where these designs are used.
7. Explain the term "Post-Hoc Tests ". Give an account of the various post-hoc tests.
8. Explain the Yate's algorithm for estimating main effects and interactions in a 2^3 factorial experiment.

IV. Write essay (any one)

(1 x 10 = 10)

1. Define CRD, RBD and LSD. Explain the procedure of laying out experiments using these designs. Give ANOVA tables of each.
2. Define Analysis of Variance. What are the assumptions of ANOVA. Discuss the procedures of analysis when the assumptions are not met.