

KERALA AGRICULTURAL UNIVERSITY

B.Sc (Hons.) Ag. 2012 Admission

VIth Semester Final Examination- July /August -2015

Cat. No: Stat.3203

Title: Design and Analysis of Experiments (1+1)

Marks: 80

Time: 3 hours

I. Fill up the blanks

(10 x 1 =10)

1. The test used in ANOVA is -----
2. _____ makes the observations independent
3. The error degrees of freedom will be maximum in ----- design
4. In a R.B.D with 7 treatments , the treatment S.S = 180 and EMS = 10, then the F calculated will be = -----
5. The optimum plot size can be obtained through ----- method
6. Local control is also called -----
7. The angular transformation is given by -----
8. If fertility gradient runs along two directions we make use of ----- design
9. To fix the number of replications in a design, usually we equate the error degrees of freedom to -----
10. In a 3x2 x3 experiment there are ----- number of treatments.

II. Write short notes on (any 10)

(10 x 3=30)

1. What do you mean by ANOVA. Write down the null hypothesis used in it.
2. Write down the practical considerations in field experiments
3. Distinguish Standard error and Critical difference
4. The total yield for 6 varieties of rice recorded from a RBD with 3 replications are 10.72, 14.8, 12.75, 12.18, 12.31 and 9.62. Find the treatment (variety) sum of squares
5. What do you mean by asymmetrical factorial experiment, give the skeleton ANOVA for two factors
6. How can you identify the main plot and sub plot factors in an experiment
7. Missing plot technique in LSD
8. How can you select an ancillary variate to perform Analysis of covariance
9. t test and F test
10. Logarithmic and square root transformation
11. ANOVA for 2³ factorial and 2 x 3 factorial experiment
12. Technology – generation and Technology – verification experiments

III. Answer the following (any six)

(6 x 5=30)

1. Give the lay out procedure for laying out 5 treatments with 4 replications using CRD
2. Explain the Yate's procedure for obtaining the various effect totals in a 2³ factorial experiment
3. Write down the computation procedure in the analysis of a LSD giving the

- structure of the ANOVA table
4. Complete the ANOVA , the following details are given:
 - a) No. of replications =4, Total d.f =27, Total S.S =7500, Treatment S.S = 5400
 - b) Six treatments were tried in 4 blocks , T.S.S = 28, Block S.S= 6, Treatment S.S = 15
 5. Suggest suitable design , fix the number of replications and give the lay out plan and skeleton of ANOVA for an experiment to be conducted to study the effect of fertilizers N, P, K and seed rate with levels S_1, S_2, S_3 on the yield of paddy. The effect of fertilizers are to be estimated with more precision
 6. Write a note on Strip plot design
 7. What are the advantages of R.B.D over C.R.D and L.S.D
 8. Write a short essay on "on farm trials"

IV. Write essay (any one)

(1x 10=10)

a) Explain the Factorial concept of experimentation. Explain how we can save space , cost etc. using this approach giving examples. A 2^2 factorial experiment was conducted in R.B.D with 5 replications. The total yield from all the replications are as follows. Find out the S.S due to different factorial effects.

Treatments	1	a	b	ab
Total yield(Kg)	12	20	25	30

b) What do you mean by designing an experiment. What are the basic principles of experimentation . Explain.