NRJ/KW/17/3184

Bachelor of Science (B.Sc.) Semester–VI (CBS) Examination
EXPERIMENTAL DESIGNS
Paper—2
Statistics

Time : Three Hours]   [Maximum Marks : 50

N.B. :— All the questions are compulsory and carry equal marks.

1. (A) Give the statement of Gauss-Markov theorem and define : linear parametric function, estimable linear parametric function, BLUE.

   (B) What is meant by ANOVA ? State the basic assumptions in the ANOVA. Explain its use.

   5+5

OR

   (E) Explain the linear model in the analysis of variance of two way classification with m entries per cell. Obtain the break up of total sum of squares. Explain how the various hypotheses can be tested.   10

2. (A) Write short notes on each of the following terms in design of experiments :
   (i) Experimental error
   (ii) Size and shape of plots and blocks
   (iii) Uniformity trials
   (iv) Fertility gradient
   (v) Principle of local control.

OR

   (E) Give the complete statistical analysis of CRD.   10

3. (A) Give the complete statistical analysis of RBD.

OR

   (E) What is a Latin square ? Give a possible layout of a (4×4) Latin square. Explain the mathematical model of LSD. Derive the least-square estimates of the parameters. Show that the sum of squares and the degrees of freedom are additive in nature.   10

4. (A) What are factorial experiments ? State the advantages of a factorial experiment over a simple experiment. Give the analysis of degrees of freedom in a factorial experiment with three factors at two levels each in three replications, arranged in an RBD. Give the expressions for the main effects and interaction effects for a 2^3-experiment.

OR

   (E) Carry out complete statistical analysis of a 2^2-factorial experiment carried out in an RBD. 10

5. Solve any **ten** :
   (A) Who developed the ANOVA Technique ?
   (B) State the linear model for one way ANOVA.
   (C) What is d.f. for E.S.S. in 3-way classified data ?
   (D) What is meant by efficiency of a design ?
   (E) State any one objective of randomisation.
   (F) State any one disadvantage of RBD.
   (G) What is a standard Latin Square ?
   (H) How is LSD, an improvement over RBD ?
   (I) Define an orthogonal treatment contrast.
   (J) Give an expression for main effect B in 2^3-factorial experiment.
   (K) State the d.f. for total sum of squares in a 2^2-factorial experiment.
   (L) Define critical difference for testing the significance of difference between two treatment mean.

   1×10=10