WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2022

STSACOR13T-STATISTICS (CC13)

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer any *four* questions from question numbers 1-6 and any *two* questions from question numbers 7-10

1. Write a note on replication and local control, as means of increasing the efficiency of a design. 5

2. With reference to CRD, find out the estimates of variances of parameters. 5

3. Explain orthogonality and confounding in factorial experiments. 5

4. In a RBD, there are two blocks. Let k be the number of treatments and $\bar{x}_1$ and $\bar{x}_2$ are the average yields of two blocks. Show that the 'between blocks' sum of square can be expressed as $\frac{k}{2}(\bar{x}_1 - \bar{x}_2)^2$. 5

5. Discuss the advantages and disadvantages of LSD. 5

6. Give the analysis of degrees of freedom in a factorial experiment with three factors at two levels each in three replications. 5

7. Give the analysis of variance for RBD, stating clearly the mathematical model and the underlying assumptions. Obtain the efficiency of this design compared to CRD. 10

8. Give an outline of the analysis of variance of a $p \times p$ LSD involving a single missing plot. What is the SE of difference between two treatment means, one of which involves the missing plot? 10

9. What is a treatment contrast? When are two such contrasts said to be orthogonal? Show that in 2^3-experiment the main effects and inter-actions are mutually orthogonal. 2+3+5

10. Describe the layout of a 2^3-experiment where all the interactions are partially confounded. In such a case, indicate dfs and SSs for all the components of treatment sum of squares. Give the expressions for the standard errors of the unconfounded and confounded effects. 10

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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