TDC (CBCS) Even Semester Exam., 2024

STATISTICS

(6th Semester)

Course No. : STSHCC-601T

(Design of Experiment)

Full Marks : 50
Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) Define experimental error.

(b) Write down the advantages of Completely Randomized Design (CRD).

(c) What is replication in design of experiments?

2. Answer *either (a) or (b)* from the following questions : 6

(a) *(i)* Write a note on shape of blocks and plots with respect to design of experiments. 3

(ii) Explain the terms 'randomization' and 'local control' in design of experiments. 3

(b) What is Completely Randomized Design (CRD)? Explain the procedure of analysis of CRD, starting from an appropriate mathematical model. 2+4=6

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) Define relative efficiency.

(b) Write the disadvantages of Randomized Block Design (RBD).

(c) What is Latin Square Design (LSD)?

4. Answer *either (a) or (b)* from the following questions : 6

(a) What is Randomized Block Design (RBD)? Give the complete analysis of RBD. 2+4=6

(b) Give the layout of 4×4 Latin Square Design (LSD). Briefly discuss the analysis of $m \times m$ LSD. 2+4=6

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) Define Balanced Incomplete Block Design (BIBD).

(b) What do you mean by symmetric BIBD?

(c) Define resolvable BIBD.

6. Answer *either (a) or (b)* from the following questions : 6

(a) Interpret the necessary conditions of BIBD.

(b) Establish the interrelationship among BIBD, symmetric BIBD and resolvable BIBD.

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) What is meant by a factorial experiment?

(b) What would be the treatment combinations in the control block, when the interaction effect *ABC* of 2^3-experiment is confounded?

(c) State the advantages of factorial experiment over simple experiments.

8. Answer *either (a) or (b)* from the following questions : 6

(a) (i) Show that in 2^3-factorial experiment, main effects and interaction effects are mutually orthogonal. 3

(ii) Explain the different types of confounding with example. 3

(b) (i) Write a short note on 3^2-design. 3

(ii) Give the plan and outline of the analysis of a partially confounded 2^3-experiment in 4 replications. 3

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What is missing plot technique?

(b) Define fractional factorial experiment.

(c) Write two merits and demerits of LSD.

10. Answer *either (a) or (b)* from the following questions : 6

(a) Explain the procedure of obtaining the estimate of one missing observation in RBD and also write the ANOVA table for the same.

(b) Give the outline of the analysis of variance of a $p \times p$ LSD involving a single missing plot.

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