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24-ST-41

**M.Sc. IV SEMESTER [MAIN/ATKT] EXAMINATION
JUNE - JULY 2024**

**STATISTICS
Paper - I
[Design of Experiments]**

*[Max. Marks : 75]**[Time : 3:00 Hrs.]**[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt five questions. Each question carries an internal choice.
Each question carries **15 marks**.

Q. 1 Explain layouts of CRD and RBD. Also compare the efficiency of RBD relative to CRD. (15 Marks)

OR

a) Describe Graeco-Latin square design. (05 Marks)

b) Find out the missing value in case of Latin Square design. (10 Marks)

Q. 2 Give statistical model, hypothesis used and analysis of variance table for split plot design. Also give its advantages and disadvantages. (15 Marks)

OR

a) Define analysis of covariance along with examples. (05 Marks)

b) Describe model, hypothesis and analysis of variance table for ANOCOVA for two way classification with single concomitant variable in RBD layout. (10 Marks)

Q. 3 Prove that a block design is said to be connected iff $\text{rank}(C) = v - 1$ (15 Marks)

OR

Give the complete analysis of general block design. (15 Marks)

Q. 4 State and Prove Fisher's Inequality. (15 Marks)

OR

a) Define resolvable and affine resolvable designs using examples. (05 Marks)

b) Prove that in a symmetric BIBD, the number of treatments common between any two blocks is λ . (10 Marks)

P.T.O.

Q. 5 Explain confounding and its types along with examples.

(15 Marks)

OR

Give the ANOVA table for 2^2 - factorial experiment. Find out main and interaction effects for 2^2 factorial experiment. Also give table of signs and divisors for the same.

(15 Marks)

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