Seat No. _____

HI-003-1172002

M. Sc. (Sem. II) Examination

April - 2023

MS-202 : Planning & Analysis of Industrial Experiments

Faculty Code : 003
Subject Code : 1172002

Time : $2\frac{1}{2}$ Hours / Total Marks : **70**

1 Answer briefly any seven of the following questions : **14**

(1) Write parameters and parametric relation of BIBD.

(2) Discuss briefly a binary Design with an example.

(3) What is meant by Confounding ?

(4) Define a-resolvable BIBD.

(5) What is the main purpose of running the experiment?

(6) Explain the concept of connectedness.

(7) Write the full form of MOLSD.

(8) What do you mean by complete diallel cross plan ?

(9) What are the limits of factorial experiments ?

(10) What is meant by replication ?

2 Answer any two of the following questions: **14**

(1) Prove that for any symmetrical BIBD (r-λ) must be a perfect square for even v.

(2) Explain Bose Inequality for BIBD.

(3) Prove that: λ (v-1) = r (k-1)

3 Answer the following questions: **14**

(a) What are the merits and demerits of balanced confounding? Give a suitable example of balanced confounding with ANOVA.

(b) Explain 3^3 factorial experiments. Write ANOVA table of 3^2 factorial experiments.

OR

3 Answer the following questions: **14**

(a) Write steps of construction of MOLS design. Give an appropriate example.

(b) Prove that $\sum_{i=1}^{n}$ ni = V – 1 for partially balanced in complete block design.

4 Answer the following questions : **14**

(a) Construct the BIBD using Block section method. Write appropriate example.

(b) Prove that $\sum_{i=1}^{m} ni\ \lambda i = r\ (k-1)$

5 Answer any **two** of the following questions : **14**

(1) Construct the BIBD with a series $v = 15, b = 15, r = 7, k = 7$ and λ =3 using Projective Geometry method.

(2) Construct the BIBD with a series $v = n-1, b = n-1, r = k = n/2$ and $\lambda = n/4$ using Hadamard Matrix.

(3) Construct the BIBD with a series $v = 4\lambda + 3, b = 4\lambda + 3, r = 2\lambda + 1 = k$ and λ, where $4\lambda + 3$ is a prime number.

(4) Construct the CDC plan with parameters $v = b = 7, r = k = 3, \lambda = 1$ (BIBD) using GF (7).

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