



DII-003-017203

Seat No. _____

M. Sc. (Sem. II) (CBCS) (Statistics) Examination

May / June - 2015

STAT.CST : 2003 : Design of Experiment

Faculty Code : 003

Subject Code : 017203

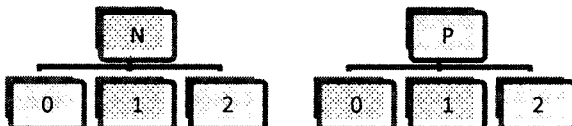
Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Q-1 Answer any seven of the following. (Any Seven)

14

- (1) Fisher's inequality follows _____.
- (a) $b \geq v$ (b) $b < r$
(c) $b > v + r + k$ (d) $b < v + r + k$
- (2) C - matrix is expressed as _____.
- a) $C = \theta \left[IV - \frac{1}{v} E_{VV} \right]$ b) $C = (r - \lambda)IV + \lambda E_{VV}$
c) $C = R^{\delta} - NK^{-1}N'$ d) Both (a) and (c)
- (3) In RBD variance of treatment contrast is _____.
- (a) $\frac{2}{r} \sigma^2$ (b) $\frac{r}{2} \sigma^2$
(c) $\frac{2}{r} \rho^2$ (d) $\frac{r}{2} \rho^2$
- (4) All Randomized Block Design are _____.
- a) Non - Orthogonal b) Balanced
c) IBD d) Orthogonal
- (5) BIBD is a _____.
- (a) Incomplete block design (b) Binary design
(c) Non-orthogonal (d) All of them
- (6) If _____ then m - ple lattice design is called balanced lattice design.
- a) $m = r$ b) $m = 2$
c) $m \neq r$ d) $m \neq 2$
- (7) Find out the level and factor of



- a) 2,3 b) 3,2
c) 2,2 d) None of the above

- (8) In YSD, column-wise it is _____ BIBD
- (a) Complete block design (b) Incomplete block design
(c) Symmetrical (d) Asymmetrical

- (9) If the level of all the factors are at lower level it is called as _____.
- a) Main effect b) Interaction effect
c) Control effect d) No effect

- (10) In Confounding experiment we _____ all the information about effect which is confounded.
- (a) neglect (b) found
(c) gain (d) loose

Q-2 Answer the following questions. (Any Two) (14)

- 1) Prove that $\lambda(V - 1) = r(K - 1)$
- 2) Construct BIBD with parameter $V=b=7, r=k=5, \lambda=1$.
- 3) What is 3^2 factorial experiment? And write down any one method.
- 4) Write down the balanced confounding 2^3 into 2^2 block size with AB, AC, and BC confounding.

Q-3 Answer the following questions. (14)

- 1) Write down properties of BIBD.
- 2) $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \\ 3 & 4 & 2 & 1 \end{bmatrix}$ Find the C-matrix and tell this design is orthogonal or not? Give proper reason.

OR

Q-3 Answer the following questions. (14)

- 1) Explain Youden square Design.
- 2) A block design is said to be connectness if $\text{Rank}(c) = v-1$.

Q-4 Answer the following questions. (Any Two) (14)

- 1) Derive Analysis of BIB design using orthogonal data.
- 2) One - missing in RBD.
- 3) Define Partial and Total Confounding with Example.
- 4) Write down the step for constructing a BIBD using Block intersection.

Q-5 Answer the following questions. (Any Two) (14)

- 1) Construct BIBD with parameter $V=b=11, r=k=5, \lambda=2$.
- 2) Find out the main effect and interaction effect for 2^2 factorial experiment by fisher's and Yates method.
- 3) Definitions: -
 - 1) Resolvable BIBD.
 - 2) α -affine resolvable BIBD.
 - 3) Connectedness.
 - 4) BIBD.
- 4) Derive intra block analysis of BIB design using non-orthogonal data.