1.What do you mean by factorial design? Describe main effects and interaction effects.

2.Define : factor , contrast , orthogonal contrast ,confounding , 22 design , 32 design , Sum of squares of factorial effect total.

3.Differentiate between total confounding and partial confounding.

4.Differentiate between simple design and factorial design.

5.Describe the layout of 23 experiment where all the interaction effects are partially confounded. In such case indicate the degree of freedom and sum of squares of all the component of treatment sum of squares.

6. .Describe the layout of 23 experiment where interaction effect ABC is completely confounded. In such case indicate the degree of freedom and sum of squares of all the component of treatment sum of squares.

7.Describe 2x2 experiment considering LSD.

8. Describe 2x2x2 experiment considering RBD.

9.Define the terms main effects and interaction effect in relation to 2x2 experiment.

10. Define the terms main effects and interaction effects in relation to 2x2x2 experiment.

11.the result of 2x2 experiment with 3 replications are presented below. Estimate the main effects , interaction effect and sum of square of factorial effect total

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment combination | Replication | | |
|  | I | II | III |
| 1 | 20 | 30 | 25 |
| a | 32 | 40 | 30 |
| b | 35 | 36 | 45 |
| ab | 50 | 46 | 42 |

12.In 2x2 experiment write down treatment combinations using standard notations. Write down expression for main effects , interaction effect , sum of square of factorial effect total if experiment is repeated r times.

13.Describe 3x3 factorial experiment considering RBD.

14.Carry out ANOVA of following design.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 64 | ab 33 | b 41 | a 33 |
| b 30 | 1 75 | a 12 | ab 10 |
| a 25 | b 50 | ab 17 | 1 75 |
| ab 9 | a 14 | 1 76 | b 25 |

15.Carry out ANOVA of following design.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 12 | s 11 | ns 13 | s 14 | n 17 | 1 12 |
| s 14 | n 13 | s 10 | 1 12 | s 14 | n 17 |
| n 18 | 1 12 | n 15 | n 16 | 1 16 | s 15 |
| ns 15 | ns 16 | 1 11 | ns 10 | ns 11 | ns 14 |

16.Carry out ANOVA of following design.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1  5 | a  6 | b  7 | Ab  9 | c  10 | ac  8 | bc  12 | abc  11 |
| a  7 | b  11 | c  13 | Ab  14 | 1  8 | bc  10 | ac  14 | abc  9 |
| abc  15 | ab  9 | ac  7 | 1  13 | c  11 | b  6 | a  8 | bc  4 |

17.Carry out ANOVA of following design.

Block I Block II

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 14 | pk 19 | nk 30 | np 24 |  | k 19 | p 27 | | n 16 | | nkp 30 | |
| Block I Block II | | | | | | | | | |
| 1 22 | k 16 | nkp 24 | np 18 |  | p 27 | | nk 30 | | pk 23 | | n 28 | | |
| Block I | | | | Block II | | | | | | |
| p 18 | nkp 17 | 1 17 | nk 21 |  | n 21 | k 12 | | pk 22 | | np 24 | | |

18. Carry out ANOVA of following design.

Block I Block II

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 14 | pk 19 | nk 30 | np 24 |  | k 19 | p 27 | | n 16 | | nkp 30 | |
| Block I Block II | | | | | | | | | |
| 1 22 | nk 16 | Pk 24 | np 18 |  | k 27 | | nkp 30 | | p 23 | | n 28 | | |
| Block I | | | | Block II | | | | | | |
| np 18 | 1 17 | nk 17 | pk 21 |  | n 21 | k 12 | | nkp 22 | | p 24 | | |