

## QUESTIONS

1. A set of data involving four “tropical feed stuffs A, B, C, D” tried on 20 chicks is given below. All the twenty chicks are treated alike in all respects except the feeding treatments and each feeding treatment is given to 5 chicks. Analyse the data.

Feed	Gain in Weight					Total $T_i$
A	55	49	42	21	52	219
B	61	112	30	89	63	355
C	42	97	81	95	92	407
D	169	137	169	85	154	714

2. Consider the results given in the following table for an experiment involving six treatments in four randomised blocks. The treatments are indicated by numbers within parentheses.

Blocks	Yield for a randomised block experiment					
1	(1)	(3)	(2)	(4)	(5)	(6)
	24.7	27.7	20.6	16.2	16.2	24.9
2	(3)	(2)	(1)	(4)	(6)	(5)
	22.7	28.8	27.3	15.0	22.5	17.0
3	(6)	(4)	(1)	(3)	(2)	(5)
	26.3	19.6	38.5	36.8	39.5	15.4
4	(5)	(2)	(1)	(4)	(3)	(6)
	17.7	31.0	28.5	14.1	34.9	22.6

Test whether the treatments differ significantly. Also

- (i) determine the critical difference between the means of any two treatments;
- (ii) obtain the efficiency of this design relative to its layout as  $C.R.D.$

3. An experiment was carried out to determine the effect of claying the ground on the field of barley grains; amount of clay used were as follows :

*A* : No clay

*B* : Clay at 100 per acre

*C* : Clay at 200 per acre

*D* : Clay at 300 per acre.

The yields were in plots of 8 meters by 8 meters and are given in the following table.

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>I</i>	<i>D</i> 29.1	<i>B</i> 18.9	<i>C</i> 29.4	<i>A</i> 5.7
<i>II</i>	<i>C</i> 16.4	<i>A</i> 10.2	<i>D</i> 21.2	<i>B</i> 19.1
<i>III</i>	<i>A</i> 5.4	<i>D</i> 38.8	<i>B</i> 24.0	<i>C</i> 37.0
<i>IV</i>	<i>B</i> 24.9	<i>C</i> 41.7	<i>A</i> 9.5	<i>D</i> 28.9

- Perform the ANOVA and calculate the critical difference for the treatment mean yields.
  - Calculate the efficiency of the above Latin Square Design over
    - R.B.D.*
    - C.R.D.*
  - Yield under 'A' in the first column was missing. Estimate the missing value and carry out the ANOVA.
4. A varietal trial was conducted at a Research Station. The design adopted for the same was five randomised blocks of 6 plots each. The yields in lb. per plot (of  $\frac{1}{20}$ th of an acre) obtained from the experiment are given in the following table.

Blocks	Varieties					
	<i>V</i> <sub>1</sub>	<i>V</i> <sub>2</sub>	<i>V</i> <sub>3</sub>	<i>V</i> <sub>4</sub>	<i>V</i> <sub>5</sub>	<i>V</i> <sub>6</sub>
<i>I</i>	30	23	34	25	20	13
<i>II</i>	39	22	28	25	28	32
<i>III</i>	56	43	43	31	49	17
<i>IV</i>	38	45	36	35	32	20
<i>V</i>	44	51	23	58	40	30

Analyse the design and comment on your findings.

5. The following data were obtained from an experiment using the treatments : 0.32 % of Blitox, 0.16 % of Dithane z-78, 0.09 % of Brestan-60 and control. After sowing rhizomes of the matgrass *Cyperus tagetum Roxb* in four plots in each of three villages, the above four treatments were applied at random to the plots in each village after 30 days of sowing. The yields in gm. of 30 sq. cm. cutting per plot after 120 days are given below. Analyse the data to find out if there are any significant treatment effects.

Treatment	Village		
	I	II	III
Blitox	678.2	510.2	531.2
Dithane z-78	703.2	689.5	611.2
Brestan-60	736.8	574.2	573.7
Control	556.4	510.2	500.0

6. Analyse the following randomised block design after estimating the missing value. Also compare the treatments  $T_1$  and  $T_2$ .

Treatment	Blocks			
	I	II	III	IV
$T_1$	19.1	—	22.5	25.5
$T_2$	26.0	28.0	27.0	33.0
$T_3$	20.5	28.5	21.5	25.5

7. The following table gives the yield of wheat (kgs./plot) as observed in an experiment carried out in a  $5 \times 5$  Latin Square. The five manurial treatments are indicated by  $A$ ,  $B$ ,  $C$ ,  $D$  and  $E$ . Obtain an estimate of the missing value and analyse the design.

	1	2	3	4	5
1	$B$ 57.8	$C$ 48.6	$A$ 33.4	$D$ 53.5	$E$ 41.8
2	$D$ 50.5	$E$ 45.5	$C$ 51.8	$B$ 52.6	$A$ 31.9
3	$A$ 46.1	$D$ 47.9	$B$ 55.6	$E$ —	$C$ 53.3
4	$C$ 58.2	$B$ 55.1	$E$ 43.2	$A$ 38.8	$D$ 53.3
5	$E$ 53.0	$A$ 41.0	$D$ 48.7	$C$ 54.6	$B$ 55.7

8. Consider the following  $2^2$  factorial experiment involving 2 factors N and S each at two levels - 0 and 1.

Block	Treatment Combination			
	(1)	$n$	$s$	$ns$
$I$	117	124	106	125
$II$	120	124	117	124
$III$	111	127	114	126
$IV$	108	131	112	125
$V$	73	138	97	95
$VI$	81	158	117	125

Analyse the design. Does treatment effect  $N$  differ from treatment effect  $S$  significantly ?