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NPTEL

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Courses » Design and Analysis of Experiments

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## Unit 6 - Week 5

### Course outline

How to access the portal

Week 1

Week 2

Week 3

Week 4

Week 5

- Lecture 25: Randomized Complete Block Design (RCBD): Introduction
- Lecture 26: Randomized Complete Block Design (RCBD): Estimation of Model Parameters
- Lecture 27: Randomized Complete Block Design (RCBD): Balanced Incomplete Block Design (BIBD)
- Lecture 28: RCBD: Latin Square Design
- Lecture 29: Graeco-Latin Square Design
- Feedback for week 5
- Quiz : WEEK\_5\_WEEK\_5

Week 6

Week 7

### WEEK\_5\_WEEK\_5

The due date for submitting this assignment has passed. **Due on 2018-02-28, 23:59 IST.**

#### Submitted assignment

#### Questions 1-6 are based on the following case:

A chemist wishes to test the effect of four chemical agents on the strength of a particular type of cloth. Because there might be variability from one bolt to another, the chemist decides to use a randomized block design, with the bolts of cloth considered as blocks. She selects five bolts and applies all four chemicals in random order to each bolt. The resulting tensile strengths as follows (use  $\alpha=0.05$ )

Chemical	Bolt				
	1	2	3	4	5
1	73	68	74	71	67
2	73	67	75	72	70
3	75	68	78	73	68
4	73	71	75	75	69

1) Mean square value of block in this experiment is 2 points

- (i) 4.32
- (ii) 1.82
- (iii) 39.25
- (iv) 12.95

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(iii) 39.25*

2) Degree of freedom the block in this experiment is 2 points

- (i) 4
- (ii) 3
- (iii) 12
- (iv) 19

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(i) 4*

3) Mean square value of treatment in this experiment is 2 points

- (i) 4.32

Week 8

Week 9

Week 10

Week 11

Week 12

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- (ii) 1.82  
 (iii) 39.25  
 (iv) 12.95

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(i) 4.32

4) Degree of freedom the treatment in this experiment is

2 points

- (i) 4  
 (ii) 3  
 (iii) 12  
 (iv) 19

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(ii) 3

5) Mean square value of residual in this experiment is

2 points

- (i) 4.32  
 (ii) 1.82  
 (iii) 39.25  
 (iv) 12.95

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(ii) 1.82

6) Degree of freedom the residual in this experiment is

2 points

- (i) 4  
 (ii) 3  
 (iii) 12  
 (iv) 19

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(iii) 12

### Questions 7-10 are based on the following case:

Three different washing solutions are being compared to study their effectiveness in retarding bacteria growth in five-gallon milk containers. The analysis is done in a laboratory, and only three trials can be run on any day. Because days could represent a potential source of variability, the experimenter decides to use a randomized block design. Observations are taken for four days, and the data are shown here. (use  $\alpha = 0.05$ )

Solution	Days			
	1	2	3	4
1	13	22	18	39
2	16	24	17	44
3	5	4	1	22

7) Mean square value of block in this experiment is

2 points

- (i) 51.83
- (ii) 8.64
- (iii) 368.97
- (iv) 351.75

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(iii) 368.97*

8) Degree of freedom the block in this experiment is

**2 points**

- (i) 2
- (ii) 3
- (iii) 11
- (iv) 6

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(ii) 3*

9) Mean square value of treatment in this experiment is

**2 points**

- (i) 51.83
- (ii) 8.64
- (iii) 368.97
- (iv) 351.75

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(iv) 351.75*

10) Degree of freedom the treatment in this experiment is

**2 points**

- (i) 2
- (ii) 3
- (iii) 11
- (iv) 6

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(i) 2*

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