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NPTEL

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Courses » Design and Analysis of Experiments

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## Unit 12 - Week 11

### Course outline

How to access the portal

Week 1

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Week 11

Quiz :  
Week\_11\_Assignment\_1

Feedback for week 11

Lecture 52:  
"Response Surface Methodology (RSM) – First Order Model "

Lecture 53:  
"Response Surface Methodology (RSM) – First Order Model (Contd.) "

Lecture 54:  
Experimental Design for Fitting

### Week\_11\_Assignment\_11

The due date for submitting this assignment has passed. **Due on 2018-04-11, 23:59 IST.**

#### Submitted assignment

An industrial engineer has developed a computer simulation model of a two-item inventory system. The decision variables are the order quantity and the reorder point for each item. The response to be minimized is the total inventory cost. The simulation model is used to produce the data shown in the following table.

	Item 1		Item 2		Total Cost
	Order Quantity (x1)	Reorder Point (x2)	Order Quantity (x3)	Reorder Point (x4)	
	100	25	250	40	625
	140	45	250	40	670
	140	25	300	40	663
	140	25	250	80	654
	100	45	300	40	648
	100	45	250	80	634
	100	25	300	80	692
	140	45	300	80	686
	120	35	275	60	680
	120	35	275	60	674
	120	35	275	60	681

1) The experimental design is:

2 points

- 
- (i)  $2^{4-1}$  fractional factorial design
- 
- (ii)  $3^{4-1}$  fractional factorial design
- 
- (iii)  $2^2$  full factorial design
- 
- (iv) None of these.

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**

(i)  $2^{4-1}$  fractional factorial design

2) The design generator is:

2 points

- 
- (i)  $I = ABCD$
- 
- (ii)  $I = -ABCD$
- 
- (iii) Both (i) and (ii)
- 
- (iv) None of these

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**

(i)  $I = ABCD$

3) The number of center points is:

2 points

Response  
Surfaces

● Lecture 55:  
Response  
Surface  
Methodology  
(RSM): Fitting  
Second Order  
Model

● Lecture 56:  
Analysis of  
Second Order  
Response  
Surface

Week 12

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- (i) 1
- (ii) 2
- (iii) 3
- (iv) 4

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(iii) 3*

4) The degrees of freedom of model is:

2 points

- (i) 3
- (ii) 4
- (iii) 5
- (iv) 6

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(iv) 6*

5) The effect of model is:

2 points

- (i) Significant
- (ii) Insignificant
- (iii) Data are insufficient
- (iv) Cannot be concluded

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(i) Significant*

6) The effect of curvature is:

2 points

- (i) Significant
- (ii) Insignificant
- (iii) Data are insufficient
- (iv) Cannot be concluded

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(i) Significant*

7) The degrees of freedom of pure error is:

2 points

- (i) 2
- (ii) 3
- (iii) 4
- (iv) 5

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(i) 2*

8) The mean square of curvature is:

2 points

- (i) 810.52
- (ii) 812.52
- (iii) 815.52
- (iv) 800.25

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*(iii) 815.52*

9) The coefficient estimate of center point is:

2 points

- (i) 20.45

- (ii) 20.33
- (iii) 18.66
- (iv) 19.33

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(iv) 19.33

10 The equation used to compute the path of steepest ascent is:

2 points

(i)  $\hat{y} = 659 + 9.25x_1 + 13.25x_2 + 7.50x_4$

(ii)  $\hat{y} = 659 + 9.25x_1 + 13.25x_3 + 7.50x_4$

(iii)  $\hat{y} = 659 + 9.50x_1 + 14.25x_2 + 7.50x_4$

(iv)  $\hat{y} = 695 + 9.25x_1 + 13.25x_2 + 7.90x_4$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

(ii)  $\hat{y} = 659 + 9.25x_1 + 13.25x_3 + 7.50x_4$

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