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NPTEL

Courses » Six Sigma

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Unit 9 - Week 8

Course outline

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Week 8 Assignment (Jan 2018)

The due date for submitting this assignment has passed.   **Due on 2018-03-21, 23:59 IST**
As per our records you have not submitted this assignment.

- Total No. of Questions: 15. Each question carries one point.
- Question 1 to 8 are objective type questions. Only one answer is correct per numbered item.
- Questions no. 6, and 7 are common data question.
- Question 9 to 13 are true/false statement questions.
- Question 14 and 15 are multiple choice questions. More than one answers are correct per numbered item.

1) The number of times each experimental condition is observed in a factorial design is known as   *1 point*

   ○ Replication
   ○ The experimental condition
   ○ A factor
   ○ None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
Replication

2) Which of the following is correct?   *1 point*

   ○ Whenever interactions are found, there must be main effects.
   ○ If there are no main effects, there can be no interactions.
   ○ Whenever main effects are found, there must be at least one interaction.
   ○ When both interactions and main effects are found, the interactions are interpreted first.

No, the answer is incorrect.
Score: 0

Accepted Answers:
When both interactions and main effects are found, the interactions are interpreted first.

3) What information is given in the factorial design notation,4X3X3?   *1 point*

   ○ The design has 36 independent variables.
   ○ The design has three independent variables,four levels of A, three levels of B,and three levels of C.
   ○ The design has three dependent variables,four levels of A, three levels of B,and three levels of C.
   ○ The design has four independent variables,three dependent variables,and three organismic variables.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The design has three independent variables,four levels of A, three levels of B,and three levels of C.

4) When the target performance is best then The S/N Ratio is defined as   *1 point*

   ○ $$SN = -10 log^{\Sigma(Y^2)}/_n$$

   ○ $$SN = 10 log\left(\frac{\bar{Y}^2}{S^2}\right)$$

$$SN = -10log^{\Sigma\left(\frac{1}{Y^2}\right)}/n$$

○

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$SN = 10log\left(\frac{\bar{Y}^2}{S^2}\right)$$

5) Which one of the following statement is wrong in reference to one-factor-at-a-time (OFAT) experimentation **1 po**
strategy?

○ Vary factors together in a specific manner.
○ Involving the testing of factors, or causes, one at a time
○ OFAT requires more runs for the same precision in effect estimation
○ OFAT can be more effective than fractional factorials under certain conditions

No, the answer is incorrect.
Score: 0

Accepted Answers:
Vary factors together in a specific manner.

6) An investigation is consolidate to examine the distortion of shaft bearing in Air conditioner. **1 point**
Two factors were included for finding out the effects, i.e. size of the gear (Y1) and the part positioning
(Y2). A study of eight gears for each tooth size and part positioning combination is displayed in the
following Table.

Tooth size	Part Positioning	
	Y2=Low	Y2=High
Y1= Low	28.0	23.5
	26.5	13.5
	36.0	21.5
	12.5	6.0
	41.5	-14.5
	21.0	14.0
	20.0	13.0
	24.5	19.0
Y1=High	27.5	7.5
	39.5	21.5
	21.0	10.0
	17.0	11.0
	27.0	14.5
	24.0	13.5
	28.0	17.5
	27.5	16.5

What will be the effect of low level and high level of apparatus size?

○ A rise from 19.125 to 20.21875 because of change is made from high level to low level effect
○ A drop from 19.125 to 20.21875 because of change is made from high level to low level effect
○ A drop from 19.125 to 20.21875 because of change is made from low level to high level effect
○ A rise from 19.125 to 20.21875 because of change is made from low level to high level effect

No, the answer is incorrect.
Score: 0

Accepted Answers:
A rise from 19.125 to 20.21875 because of change is made from low level to high level effect

7) What will be the effect of low level and high level of part positioning? **1 point**

○ A drop from 26.34375 to 13 because of change is made from high level to low level effect.
○ A rise from 26.34375 to 13 because of change is made from high level to low level effect.
○ A drop from 26.34375 to 13 because of change is made from low level to high level effect.

      ○ A rise from 26.34375 to 13 because of change is made from low level to high level effect

No, the answer is incorrect.
Score: 0

Accepted Answers:
A drop from 26.34375 to 13 because of change is made from low level to high level effect.

8) Following table is an example of analysis of Fire lighting coil to determine if it will withstand salt water. Find out which one is the design factor (D) and noise factor (N).   *1 point*

Factor	Low level	High level	Factor type
Water pressure	10 PSI	20 PSI	?
Seal Material	Silicone	Iron	?
Type of salt	Detroit Blue	Chicago Pink	?

      ○ N, D, N
      ○ D, D, N
      ○ D, N, D
      ○ N, D, D

No, the answer is incorrect.
Score: 0

Accepted Answers:
N, D, N

9) The factors in a factorial design is the dependent variable.   *1 point*

      ○ True
      ○ False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

10) The appropriate statistical test for a factorial design is t-test.   *1 point*

      ○ True
      ○ False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

11) In factorial designs, the response produced when the treatments of one factor interact with the treatments of another in influencing the response variable is known as the main effect.   *1 point*

      ○ True
      ○ Flase

No, the answer is incorrect.
Score: 0

Accepted Answers:
Flase

12) RSM deals with technique for studying multiple response.   *1 point*

      ○ True
      ○ False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

13) Mr Bibekanand performed an RSM (response surface methodology) experiment to design a   *1 point* workshop of manufacturing, for this experiment they assumed three different factors durability (D), Maintainability (M) and force (F). The correct equation for RMS experiment is

$$Y = a_1 + a_1 D + a_2 M + a_3 F + a_{12} D^2 + a_{13} M^2 + a_{23} F^2 + a_{11} DM + a_{22} MF + a_{33}$$

      ○ True

○ Flase

No, the answer is incorrect.
Score: 0

Accepted Answers:
Flase

14) Which of the statements is/are correct.   *1 point*

☐ A confounding variable is an outside influence that changes the effect of a dependent and independent variable.
☐ The control variable is the experimental element which is constant and unchanged throughout the course of the investigation.
☐ An in**dependent variable** is the variable being tested and measured in a scientific experiment
☐ All of the statement is correct.

No, the answer is incorrect.
Score: 0

Accepted Answers:
A confounding variable is an outside influence that changes the effect of a dependent and independent variable.
The control variable is the experimental element which is constant and unchanged throughout the course of the investigation.

15) Which of the statements is/are correct.   *1 point*

☐ Repetition occurs when multiple sets of measurements are made during one scientific investigation.
☐ Replication occurs when multiple sets of measurements are made during one scientific investigation.
☐ Repetition occurs when a scientific investigation is reproduced by another person.
☐ Replication occurs when a scientific investigation is reproduced by another person.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Repetition occurs when multiple sets of measurements are made during one scientific investigation.
Replication occurs when a scientific investigation is reproduced by another person.

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