Unit 10 - Week 9

Week_9_Assignment_9

The due date for submitting this assignment has passed. **Due on 2018-03-28, 23:59 IST.**

Submitted assignment

1) The key ideas used for the successful implementation of fractional factorial design are: ***2 points***

- (i) sparsity of effects principle, projection property, sequential experimentation
- (ii) sparsity of effects principle, randomization, and repetition
- (iii) sequential experimentation, sparsity of effects principle, randomization
- (iv) Both (i) and (iii)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) sparsity of effects principle, projection property, sequential experimentation

2) When we estimate A, B, and C with complementary one-half fraction, we are really estimating: ***2 points***

- $(i)(A \times BC, B \times AC, C \times AB)$
- $(ii)(A + BC, B + AC, C + AB)$
- $(iii)(A - BC, B - AC, C - AB)$
- (iv) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(iii)(A - BC, B - AC, C - AB)$

3) One-half fraction with I= - ABC is called: ***0 points***

- (i) alternate fraction
- (ii) complementary fraction
- (iii) Both (ii) and (iii)
- (iv) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
(iii) Both (ii) and (iii)

4) The designs in which no main effects are aliased with any other main effect, but main effects are aliased with two-factor interactions and some two-factor interactions may be aliased with each other, are called: ***2 points***

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- (i) Resolution III design
- (ii) Resolution IV design
- (iii) Resolution V design
- (iv) None of these.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) Resolution III design

5) The designs in which no main effect or two-factor interaction is aliased with any other main effect or two-factor interaction, but two factor interactions are aliased with three-factor interactions, are called: ***2 points***

- (i) Resolution III design
- (ii) Resolution IV design
- (iii) Resolution V design
- (iv) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
(iii) Resolution V design

6) The designs in which no main effect is aliased with any other main effect or with any two-factor interaction, but two-factor interactions are aliased with each other, are called: ***2 points***

- (i) Resolution III design
- (ii) Resolution IV design
- (iii) Resolution V design
- (iv) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
(ii) Resolution IV design

Questions 7- 10 are based on the following case:

A nickel-titanium alloy is used to make components for jet turbine aircraft engines. Cracking is a potentially serious problem in the final part, as it can lead to non-recoverable failure. A test is run at the parts producer to determine the effects of four factors on cracks. The four factors are pouring temperature (A), titanium content (B), heat treatment method (C), and the amount of grain refiner used (D). Only a one-half fraction of the 2^4design is run, and the length of crack (in micro-m) induced in a sample coupon subjected to a standard test is measured. Construct the design and perform the analysis, using the data from replicate I. The data are shown below:

A	B	C	$D=ABC$		
-	-	-	-	(1)	1.71
+	-	-	+	*ad*	1.86
-	+	-	+	*bd*	1.79
+	+	-	-	*ab*	1.67
-	-	+	+	*cd*	1.81
+	-	+	-	*ac*	1.25
-	+	+	-	*bc*	1.46
+	+	+	+	*abcd*	0.85

7) The required design is a: ***2 points***

$(i)2^{4-1}$

$(ii)2^{3-1}$

$(iii)2^{4}$

(iv) None of these.

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(i)2^{4-1}$

8) The effect of D is: ***2 points***

- (i) 0.049
- (ii) 0.050
- (iii) 0.055
- (iv) 0.069

No, the answer is incorrect.
Score: 0

Accepted Answers:
(iii) 0.055

9) The % contribution of C is: ***2 points***

- (i) 40.55
- (ii) 50.44
- (iii) 42.56
- (iv) 50.29

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) 40.55

10) The largest three effects are: ***2 points***

- (i) A, C, and AC
- (ii) A, B, and AB
- (iii) B, D, and BD
- (iv) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) A, C, and AC

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