Statistics 506
Test 2

1. An experimenter ran the same experiment (same factors and response) using two different fractional factorial designs–4 factors in 8 runs with the generators I=ABCD and I=-ABCD. The list of computed effects appears below.

I=ABCD		I=-ABCD	
Effect	Value	Effect	Value
A+BCD	0.0	A-BCD	-5.7
B+ACD	0.8	B-ACD	3.2
C+ABD	14.0	C-ABD	15.9
AB+CD	16.0	AB-CD	-12.2
AC+BD	-1.0	AC-BD	-3.9
BC+AD	-2.2	BC-AD	-.8
D+ABC	3.3	D-ABC	-3.8

   (a) Construct probability plots for both experiments. Which factors are significant?

   (b) Based on your response to the above question, which members of the significant alias pairs do you think are responsible for the observed significant effects?

   (c) Write down the levels of factors A, B, C and D for the I=ABCD fraction. Now write down the foldover runs. What do you observe? What conclusions can you make about folding over a Resolution IV design?

2. A fractional factorial (5 factors in 8 runs) appears below.

A	B	C	D	E	Responses
-1	-1	-1	-1	-1	4.2
-1	-1	1	1	1	-4.1
1	-1	-1	1	1	-5.3
1	1	-1	-1	1	6.1
-1	1	-1	1	-1	2.9
-1	1	1	-1	1	-2.0
1	1	1	1	-1	-6.3
1	-1	1	-1	-1	6.0

   (a) Use Define Custom Factorial Design to help analyze the design. What is D confounded with? What is E confounded with?

   (b) Analyze the design.

   (c) Suppose you had only the Response Table available for analyzing the data. How should you enter the responses in order to compute the effects correctly?