Statistics 506
Test 2

1. A 3-factor design was replicated twice. Results appear in the table below.

A	B	C	Rep 1	Rep 2
-1	-1	-1	29.01	28.58
1	-1	-1	33.93	34.82
-1	1	-1	41.60	34.24
1	1	-1	22.74	29.06
-1	-1	1	35.42	33.20
1	-1	1	28.98	31.62
-1	1	1	26.03	32.06
1	1	1	38.60	38.22

   (a) Use Minitab to analyze the replicated design and construct T statistics. Which effects are significant at the .05 level? Using the significant effects, what would be the EMR if we wanted to maximize the response?

   (b) Consider the first and second replicates as separate experiments. Construct effects plots; which effects seem significant?

   (c) Compare results from the analyses. Are they roughly consistent?

2. An experimenter studied 6 factors in 16 runs by assigning E to -ACD and F to ABD. The data for the experiment appears in the table below

A	B	C	D	E	F	Response
-1	-1	-1	-1	1	-1	12.4
1	-1	-1	-1	-1	1	0.7
-1	1	-1	-1	1	1	19.2
1	1	-1	-1	-1	-1	10.2
-1	-1	1	-1	-1	-1	1.4
1	-1	1	-1	1	1	9.5
-1	1	1	-1	-1	1	13.5
1	1	1	-1	1	-1	17.9
-1	-1	-1	1	-1	1	9.8
1	-1	-1	1	1	-1	17.0
-1	1	-1	1	-1	-1	2.4
1	1	-1	1	1	1	10.4
-1	-1	1	1	1	1	15.9
1	-1	1	1	-1	-1	9.9
-1	1	1	1	1	-1	11.2
1	1	1	1	-1	1	4.2

   (a) What terms are aliased with I? What is the resolution of this design? Explain.

   (b) Analyze the data. Which effects are important?

   (c) What are the 8 runs for which I=AEF? *Show your work for this next question.* What is the full design generator for the 8 foldover runs? Analyze these 8 runs. Are your results similar to what you obtained for the 16-run design?

   (d) Fold over the 8-run design and re-analyze the data. Do you recover the results from the original 16-run design?