Statistics 506
Final Exam

1. An experimenter studying 4 factors in 8 runs with 4 blocks generated the following experimental data:

A	B	C	D	Block	Response
-1	1	1	-1	1	119.9
1	-1	-1	1	1	128.7
-1	1	-1	1	2	125.6
1	-1	1	-1	2	131.2
-1	-1	1	1	3	120.1
1	1	-1	-1	3	125.9
-1	-1	-1	-1	4	127.1
1	1	1	1	4	133.7

   (a) What effect is D confounded with?
   (b) What is the alias structure for this design? (Do not discuss blocks yet)
   (c) Analyze the data. Which effects are significant?
   (d) Which factors is Block confounded with? Does Block seem significant?

2. An experimenter created a 6-factor 8-run design.

A	B	C	D	E	F	Response
-1	-1	-1	-1	1	1	31.5
1	-1	-1	1	-1	1	34.9
-1	1	-1	1	-1	-1	34.2
1	1	-1	-1	1	-1	34.2
-1	-1	1	1	1	-1	26.0
1	-1	1	-1	-1	-1	25.1
-1	1	1	-1	-1	1	28.5
1	1	1	1	1	1	28.5

   (a) What is the design generator? What is the alias structure?
   (b) Analyze the data in Minitab.
   (c) The foldover runs appear below (they should be in order, but be careful to check when entering the responses in Minitab):

A	B	C	D	E	F	Response
1	1	1	1	-1	-1	37.9
-1	1	1	-1	1	-1	38.4
1	-1	1	-1	1	1	33.8
-1	-1	1	1	-1	1	30.7
1	1	-1	-1	-1	1	25.9
-1	1	-1	1	1	1	29.4
1	-1	-1	1	1	-1	19.3
-1	-1	-1	-1	-1	-1	23.9

   (d) What is the design generator for the second half of the experiment?
   (e) Analyze the data and compare the analysis to your analysis in part (b).
   (f) Analyze the full foldover design. Compare results from your analysis to the analyses in (b) and (e).