Statistics 506
Final Exam

1. An Excel workbook contains the responses for a full factorial 5-factor design.

   (a) Analyze the data, and discuss any significant effects.

   (b) Use Minitab's default settings for a 5-factor full factorial 4-block design to create a new worksheet and enter the appropriate responses in the worksheet. Which factors are aliased with block? Analyze the data and compare results to your analysis in part (a).

   (c) Based on your analyses, would the Block generators ABCDE and BCD have been a reasonable alternative to Minitab's default generators? Why or why not?

   (d) Use Minitab's default settings for a 5-factor, 1/4 fraction, 2-block design (i.e., 8 runs in 2 blocks) to create a new worksheet, and then enter the appropriate responses in the worksheet. Which factors are confounded with block? Which factors are confounded with each other? Based on the significant effects you discovered in (a), do you see any problems in interpreting results from this particular set of runs. Analyze the data and compare results to your analysis in part (a).

2. An experimenter created a 5-factor 8-run design by assigning D=ABC and E=BC.

A	B	C	D	E	Response
-1	-1	-1	-1	1	16.77
1	-1	-1	1	1	31.42
-1	1	-1	1	-1	37.40
1	1	-1	-1	-1	35.34
-1	-1	1	1	-1	34.66
1	-1	1	-1	-1	32.57
-1	1	1	-1	1	16.30
1	1	1	1	1	33.56

   (a) What is the design generator? What is the alias structure?

   (b) Analyze the data in Minitab.

   (c) Fold over the experiment. 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	Response
1	1	1	1	-1	34.69
-1	1	1	-1	-1	34.00
1	-1	1	-1	1	35.56
-1	-1	1	1	1	12.89
1	1	-1	-1	1	31.36
-1	1	-1	1	1	15.09
1	-1	-1	1	-1	32.45
-1	-1	-1	-1	-1	31.85

   (d) What is the design generator for the foldover experiment? What is the resolution of this design?

   (e) Analyze the data and compare the analysis to your analysis in part (b). Are there any remaining uncertainties in your analysis of this experiment?