Math 345, Elementary Statistics **04 March 2010**
Exam 1 **Crawford**
Name: _____

- No books or notes (in any form) allowed.
- You may use a calculator and the formula sheet.
- Clearly indicate your answers.
- ***Show all your work*** – partial credit may be given for written work.
- Good Luck!

	Score
1	/6
2	/20
3	/8
4	/16
5	/30
6	/10
7	/12
Total	/100

1. (6 pts). How many different arrangements of the letters of the word LOOPHOLE are there?

2. (20 pts). A survey of 334 randomly selected adults asked them whether they were satisfied with the TV coverage for a recent natural disaster. The results are summarized in the table below

	Female	Male
Satisfied	88	55
Not Satisfied	122	49
Did not watch TV coverage	8	12

(a). If one person from the survey is randomly selected, find the probability that the person chosen did not watch the TV coverage. Is it unusual for a person to not watch the TV coverage?

(b). If one person from the survey is randomly selected, what is probability that the person chosen is satisfied and a female?

(c). If one person from the survey is randomly selected, what is probability that the person chosen was male given that the person was not satisfied?

(d). If three *different* people from the survey are randomly selected, what is the probability that all three are satisfied?

3. (8 pts). The Department of Public Health tests public swimming areas for E. coli bacteria contamination. Based on past results there is a 2% chance of finding E. coli from a water sample from a public swimming area. To save on lab costs, they combine 6 water samples and test the combined sample. Further testing is needed only if the combined water sample fails. What is the probability that at least one of the 6 water samples will have E. coli?

4. (16 pts). There are 16 candidates for 4 positions on a city council.

(a). Suppose that each of the 4 positions on the city council are in charge of one of the following city issues: Parking, Snow Removal, Farmer's Market, Crime. How many different ways can 4 people from the pool of 16 candidates be put in charge of the 4 different issues?

(b). If we don't care about being in charge of different issues, how many different ways can the 4 positions be filled from this pool of 16 candidates?

(c). If the pool of candidates consists of 9 Democrats, 5 Republicans, and 1 Independent, how many ways can the positions be filled so that you have 2 Democrats, 1 Republican, and 1 Independent? [Don't worry about being in charge of different issues.]

5. (30 pts). The following data gives the number of meals eaten out during a given week by 13 randomly selected people between the ages of 25-40.

3 8 5 1 8 5 2 12 15 1 0 6 5

(a). Find each of the following. [You may use the STAT/LIST features of your calculator, when possible

(a) mean (b) median (c) mode (d) midrange

(e) range (f) standard deviation (g) variance

(b). Find the percentile corresponding to 6 meals eaten out.

(c). Find the 65^{th} Percentile, i.e. P_{65}

(d). Construct a boxplot.

(e). Suppose the number of meals eaten out during the same week is recorded for 13 randomly selected people between the ages of 65-80. The 5-number summary for this data is

$$\min = 0, \qquad Q_1 = 4.5, \qquad \text{median } = 7, \qquad Q_3 = 9, \qquad \max = 18$$

Construct a boxplot and make a statement (1-2 sentences) comparing the results with part(d).

6. (10 pts). Currently, gas prices in Wyoming are the cheapest with a mean of \$3.075 per gallon and standard deviation of \$0.091. The gas prices in Illinois are \$3.497 with a standard deviation of \$0.122. If a person in Wyoming paid \$3.195 and a person in Illinois paid \$3.665,

(a). Which one of them got a relatively better deal?

(b). Did either of them pay an unusual amount for a gallon of gasoline? Justify your answer.

7. (12 pts). The speeds of 30 cars on a city street were measured by a radar device. the results are given below:

27 25 29 26 21 23 23 28 33 23 22 22 27 25 24 38 52 25 27 18 43 31 29 25 48 24 30 28 34 23

Starting with a lower class limit of 18, construct a frequency distribution with a class width of 5 ***and*** the corresponding cumulative frequency distribution.

[Label all tables and graphs.]