MAT 121

FINAL EXAM — May 7, 2012

Name: ________________________________
Signature: ____________________________

Instructor: (please circle one)

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Read before you begin:
***********************************************************************
1. Write your full name.
2. You are allowed to use your text book and 6 by 8 index cards. The cards must be attached to the text.
3. Your lecture notes are not allowed. You may use a calculator.
4. Write clearly, and give sufficient details to justify your answers.
5. The use of mobile phones or pagers is not allowed.

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1. (10 points) In each statement, identify which of these sampling is used: random, systematic, convenience, stratified, or cluster.

(a) A market researcher selects 500 people from each of all 50 American states.

(b) An education researcher randomly selects 10 universities and interviews all the teachers at each university.

(c) Four different classes from Syracuse University were randomly selected, and all of their students were surveyed about their satisfaction of SU fitness center.

(d) A sample consists of every 10th student from a class of 163 students.

(e) A person was asked to estimate the average height of american men based on a sample of heights of 30 people. He contacted 30 persons from his family members and measured their heights.
2. (10 points) Construct a Leaf and Stem Plot of the following data:

1.1, 2.1, 1.1, 1.2, 3.5, 2.2, 3.5, 3.1, 3.7, 4.2, 4.1, 3.2
3. (10 points) Consider the following sample of data values:

10, 9, 7, 12, 11, 9, 12, 8, 13, 10.

(a) Find $P_{27}$.

(b) Find $P_{70}$. 
4. (12 points)

(a) How many ways are there to select a committee of 3 members from among 10 faculty members?

(b) How many ways can a Mathematics department with 11 members choose a Head, Vice-Head, Secretary, and Office Coordinator? (No one person can hold two or more positions).
5. (10 points) A die is rolled 3 times. What is the probability of getting at least one 4?

6. (12 points) 90% of the students own laptop computers at a certain large university. Suppose 9 students are chosen at random.
   
   (a) What is the probability that exactly 7 of them own a laptop computer?

   (b) What is the probability that at least 8 of them own a laptop computer?
7. *(12 points)* For a certain brand of light bulb the mean lifetime is 6500 hours with a standard deviation of 400 hours. If a random sample of 52 of these light bulbs is chosen, what is the probability that the mean lifetime of the bulbs in that sample is at least 6450 hours?
8. *(12 points)* You want to estimate the proportion of Americans who like the health care reform bill. You want the error to be at most 0.03 and you want the confidence level to be 99%. You have no prior estimate of the proportion. What should your sample size be?
9. (12 points) A simple random sample of 17 candy bars from a certain factory has a mean weight of 7.96 ounces with a sample standard deviation of 1.23 ounces. Make a 95% confidence interval for the mean weight of all candy bars from that factory. Assume candy bar weights are normally distributed.