Name: _____

Exam #2b – Math 63
Fall 2006

Instructions: Show all work to complete each question. Box your final answer. For each question, follow any pertinent directions given within the question.

1. For the following questions fill in with cluster, random, stratified, convenience or systematic.

   a) A method of sampling which divides the population into separate groups and then randomly selects entire groups is called a _____ sample.

   b) In a _____ sample each member of the sample frame might be given a number and if it ends in a 23, then that member is chosen for the sample.

   c) The type of sample that you might take if you are on a low budget and have a time crunch. This type, a _____ sample is probably the worst type.

   d) A(n) _____sample of n subjects from a population is one in which each possible sample of that size has the same chance of being selected.

   e) A method of sampling which divides the population into separate groups and then selects a simple random sample from each group is called _____ sample.

2. Circle all of the following which could not be probabilities.

   1.07 $\frac{7}{8}$ 1 -0.58

3. Complete the probability distribution below by using your knowledge of the requirements.

Outcomes	A	B	C	D
Probabilities	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	

4. For the following scenario, answer the questions:

   2 fair dice are rolled, and the sum is calculated

a) Give all the possible combinations, the sample space

b) Give the probability distribution of the sums

X	2										
P(x)											

c) Find the probability that the sum on the dice is a 2 or 7

d) Find the probability that the sum is 5 two times in a row

5. A survey of senior citizens at a doctor's office shows that 59% take blood pressure medication, 47% take cholesterol medication and 6% take both. Answer the following questions using this information.

a) If the event that a senior takes blood pressure medicine is B, write the probability of event B using symbols.

b) If the event that a senior takes cholesterol medicine is C, write the probability of event C using symbols.

c) Write the event that a senior takes both medicines using symbols.

d) Write the probability that a senior citizen takes either blood pressure medicine or cholesterol medicine using symbols. Include the symbols for how you will find this probability.

e) Find the probability that a senior citizen takes either blood pressure medicine or cholesterol medicine.

6. For the following scenario answer the questions:
The participants in a homeowners' survey were questioned about their educational background and marital status. Of the 400 participants, 160 had no college degrees, 108 were single and 100 were single college graduates.

a) Fill in the following 2 way table for the above information.

	Single	Married
College		
No College		

b) What's the probability that a randomly selected person is single?

c) What's the probability that a randomly selected person is married and went to college?

d) What is the probability that a randomly selected married person is went to college?

7. The serum cholesterol is an important risk factor for coronary disease. The level of of serum cholesterol is ~N(219, 50) in mg/dL. What is the probability that a randomly selected person will have a borderline high serum cholesterol level (that is, > 200, but < 250 mg/dL)? Find the probability that the mean cholesterol level with be in this range for a sample of 625.

8. A multiple choice test has 10 questions each of which has 5 possible answers, only one of which is correct. If Judy, who did not study for the test, guesses on all questions, what is the probability that she will answer exactly 3 questions correctly? Use the binomial distribution to calculate the probability. Use the normal distribution to approximate the probability.