Date: _____

YOUR STUDENT NO.

EXAMINATION NO.
050274

Name: _____

Introduction to Business Statistics

Instructions: All of the questions on this examination should be answered on the sheets provided. Write your name and your student number at the top of each sheet. Be certain to indicate the proper number before each of your answers. Remember to show your work if an answer requires a mathematical solution. If you need additional space, you may write on the back of the answer sheets.

Answer any two of the following four questions. Each answer is worth 20%.

1. Assume you have a data set from a normally distributed random variable. Answer the following questions about it.

a. Will the random variable be discrete, continuous, or neither? How do you know?
b. Will the data be qualitative or quantitative? How do you know?

2. Assume the following data were gathered by a manufacturer of a robotics component, in units of days of continuous use until the component fails. There are 60 measurements in this data set. Show a histogram of this data set with 10 bins of equal size, spanning the range from the data minimum to the data maximum.

142	147	127	161	145	137	122	123	141	139	139
135	135	130	147	118	154	133	136	129	139	131
143	130	160	127	127	145	144	155	128	124	144
133	136	133	151	131	133	119	122	139	128	121
142	136	148	136	121	131	125	120	123	145	140
150	136	135	133	134						

(Continued on reverse side)

3. A university has been tracking the percentage of alumni giving to its annual fund each year for the past 10 years. The data is given here.

14% 13% 15% 21% 19% 24% 25% 28% 25% 31%

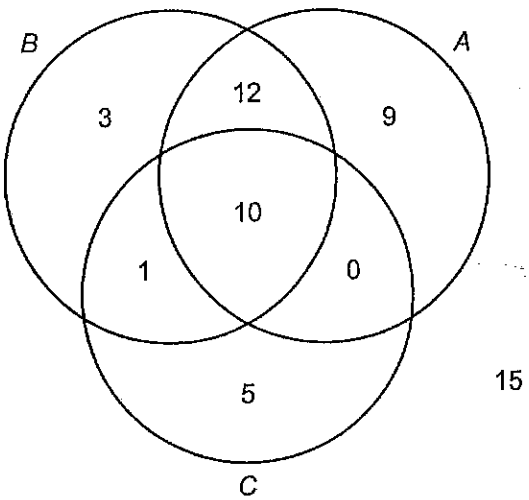
Answer the following questions about this data.

a. What are its mean and median?
b. What is the procedure for using mean and median to determine whether the data is skewed, and if so, in what direction?
c. Apply the procedure you described to the mean and median computed in part a.

4. A nurse is considering going back to graduate school to earn a Ph.D. in biochemistry. One of the schools she visits tells her that the average time to earn the degree she's considering is 5.5 years. Show that this statement is not sufficiently precise by giving two different explanations of what it might mean.

Answer any two of the following three questions. Each answer is worth 15%.

5. In the diagram below, events *A, B,* and *C* are shown with numbers in various regions of the graph indicating how many sample points lie in each. For example, the number 3 in the top left of the diagram indicates that there are 3 sample points in *B* that are not also in either *A* or *C*.



a. Are the events *A* and *B* independent?
b. Are the events $A \cap B^c$ and $C \cap B^c$ mutually exclusive?

6. Under which of the following conditions would it be appropriate to use a Binomial random variable? In each case, explain why your answer is correct.

a. A department will interview 10 candidates for a position, and call back for second interviews those who answer the interview questions to the satisfaction of all the interviewers. They hope to call back at least 3, but past experience suggests an average of about 1 call back per 4 interviews.

b. A factory posts on the wall the number of days since its last safety infraction or injury. In the past year, the factory has had a safety infraction or injury on 6 different days. The factory is interested in the number of days that can be expected to elapse without an injury.

c. Fifteen of a doctor's patients have the same ailment. Studies have shown that about 86.5% of patients with this ailment respond to a certain drug. The doctor prescribes the drug to all 15, but the number who will respond in this case is, of course, not known in advance.

7. The mean time for a racecar driver's crew to perform a pit stop is 13.2 seconds, with a standard deviation of 0.9 seconds. To maintain his current lead, the driver needs a pit stop in 12.5 seconds or less. Assuming this random variable is normally distributed, what is the probability of the driver getting the pit stop in a short enough time to maintain his lead?

Answer any two of the following three questions. Each answer is worth 15%.

8. From a sample of size 175, the sample mean is $\overline{x} = 54.37$ and sample standard deviation is $s = 7.07$.

a. Construct a 95% confidence interval for the population mean and show your work.

b. Explain how your work in part a would have been different if the sample size had been only 12 instead.

9. A random sample from the population of registered voters in California is to be taken and then surveyed about an upcoming election. What sample size should be used to guarantee a sampling error of 3% or less when estimating p at the 95% confidence level?

10. a. Explain the two conditions required for a valid large-sample test of hypothesis for a mean.

b. Explain the two different possible outcomes of a test of hypothesis.

Date: _____

YOUR STUDENT NO.

EXAMINATION NO.
08088000

Name: _____

Consumer Behavior

Part A: Answer each of the following questions in a composition of 10 to 20 sentences. Each answer is worth 20 points.

1. What I know about the price of a pound of Brand X chocolate and how that price compares to the same amount of competitive brands is important to marketing decision-makers. What is the term for my knowledge of each price and why is this knowledge of it important to marketers and managers?

2. In what social class would you place professional athletes? How about actors and actresses? Explain your position.

3. What are all of the following groups called? How does each one differ from the other in the pairs given?

   Primary, secondary

   Formal, informal

   Aspirational, dissociative

(Continued on reverse side)

Part B: Answer each of the following items in two or three sentences. Each response is worth four points.

1. What is the common major contribution that the analysis of consumer behavior makes to the fields of finance, production, insurance, and top management administration?

2. A grocery store chain recently completed a study of consumers who patronize their stores. The study showed that the amount spent during a shopping trip depended on the number of times a consumer had shopped in a particular store. Consumers spent much more money when it was only their first or second trip. How can you explain this finding?

3. Why is it useful to have an integrated marketing communications program?

4. Read over this short list of product categories:

   - Toothpaste
   - Flour
   - Men's cologne
   - Toilet tissue
   - Bread
   - Lightbulbs
   - 35mm cameras
   - Sports cars

   Group these categories according to the type of decision process you would expect most people to follow when buying a new product or trying a different brand in each category.

5. Why is a knowledge of lifestyle helpful to marketers and the companies that hire them?

6. Which of the major ethnic groups in the United States receives most of the attention from marketers and consumer analysts? Why?

7. Why is the family life cycle important to marketers?

8. What are some of the concerns one should have in using attention-getting stimuli?

9. Listed below are a few tips for designing yellow pages adapted from a list that appeared in *Link,* a trade magazine for the yellow pages industry:

   a. It's OK to use black ink if you do it wisely.
   b. Notice how copy is arranged in most ads. Do the opposite.
   c. Cluttered ads confuse and repel the reader.

   Identify the principles for gaining attention that are reflected in these tips.

10. The product manager for a new brand of skin softener is considering two possible names, *Soft Skin* and *Dickson's Skin Moisturizer.* Which name would you recommend? Why?