Read each question carefully. Make sure you answer every part of every question.

1. Massachusetts General Hospital wanted to get an idea of the average hospital stay of patients who had circulatory problems. They looked at the records of 350 patients and found that the average was 4.7 days.
   
   a. Describe the population of interest in this study.
   
   b. Describe the sample for this study.
   
   c. What is the variable in this study?

2. Alex decided to bring a snack and beverage in to his Block 4 class. Of the 21 people, he asked 4 students in the class whether they preferred cupcakes, donuts, or brownies and whether they preferred coffee or orange juice.
   
   a. Alex found that 50% of the students asked preferred cupcakes. Is this a descriptive statistic or inferential statistic? Explain your answer using complete sentences.
   
   b. Is Alex’s data set univariate or bivariate? Explain your answer using complete sentences.
3. Classify each of the following attributes as either categorical or numerical. For those that are numerical, determine whether they are discrete or continuous.
   
   a. Number of pages in the 25 best-selling mystery novels
   
   b. Temperatures inside 10 pizza ovens in degrees Fahrenheit
   
   c. Ratings of textbooks (poor, fair, good, excellent)
   
   d. Times required to complete a game of Monopoly

4. Ages of children in Wonder Years day care center were recorded.
   
   a. Is this numerical data considered discrete or continuous? Explain your answer.
   
   b. It is found that the average age of a child at Wonder Years daycare is about 3.25 years. Is this a descriptive statistic or inferential statistic? Explain your answer.
   
   c. Based on the data collected, it is expected that the average age of a child in any daycare in NH is about 3.25 years. Is this a descriptive statistic or inferential statistic? Explain your answer.
The article “Television’s Value to Kids: It’s All in How They Use It” (*Seattle Times*, July 6, 2005) described a study in which researchers analyzed standardized test results and television viewing habits of 1700 children. They found that children who averaged more than two hours of television viewing per day when they were younger than 3 tended to score lower on measures of reading ability and short term memory.

a. Is the study described an observational study or an experiment? Explain.

b. Describe the independent variable.

c. Describe the dependent variable.

d. Explain the concept of confounding variable in the context of this study. Include an example of a possible confounding variable.

Two different survey questions regarding illegal immigrants were given to a sample. In one survey, subjects were asked, “Should illegal immigrants be prosecuted and deported for being in the US illegally, or shouldn’t they?” In the second survey, subjects were instead asked, “Should illegal immigrants be given a chance to keep their jobs and eventually apply for legal status?”

a. Do you expect that the results of the two surveys reported similar stances on illegal immigrants? Explain.

b. The two surveys are examples of which type of sampling bias?
7. What type of sampling bias is described in each of the following situations? Explain your answer using complete sentences.

   a. One part of the Demographic and Health Surveys Program is concerned with measures of malnutrition. Investigators measure physical aspects of growing children, and attempt to document the physical characteristics of a population at different ages. Sadly, in some countries many children die early, and thus a bias is introduced in the study when the investigators cannot collect the data from the deceased children.

   b. SHS is deciding whether to change their cell phone policy. They want to choose a policy that satisfies everyone in the school – faculty, students, and administration. The principal and deans devise a new policy and present it to the faculty for feedback.

8. Faculty at Phillips Exeter wished to investigate how long students spent doing homework the week before winter break. The head of the math department went to the school library and asked the first 30 students he saw.

   a. What type of sampling method was used to obtain their sample? Simple Random, Stratified Random, Cluster, Systematic, or Convenience?

   b. Do believe the sampling method they used led to a sample that is representative of the population? Explain using complete sentences.
9. What type of sampling method was used to obtain each sample?

a. A developer of a new diabetes medicine wishes to test its effectiveness. He obtained a list of patients willing to participate in his experiment and chooses every third to receive the treatment.

b. Boston College’s Health Department did a study on the sleep habits of their students on school nights. They randomly selected 100 freshmen, 100 sophomores, 100 juniors, and 100 seniors to survey.

c. The ABC program *Nightline* once asked whether the United Nations should continue to have its headquarters in the United States. Viewers were invited to call one telephone number to respond “Yes” and another for “No”. There was a charge for calling either number. More than 186,000 callers responded, and 67% said “No”.

d. Chipotle has just put in to place new safety guidelines to prevent foodborne illness. They wish to find out how satisfied their employees are with the new guidelines. They pick 50 restaurants at random and survey every employee at those restaurants.

10. Dolce Vita Salon’s owner, Maria, wants to survey her clients regarding their satisfaction with the Salon. Which of the following correctly describes how Maria could break her client list into strata?

   A. Clients on a Monday, clients on a Tuesday, clients on a Wednesday, etc
   
   B. Hair coloring clients, haircut clients, styling clients, makeup clients, piercing clients
   
   C. Every 12th person on Maria’s list of clients
   
   D. Clients that purchased hair care products, clients that did not purchase hair care products
11. Give an example of a double-blind experiment.

12. You are hired by an Education Consultant company to determine whether listening to classical music while studying Statistics vocabulary results in higher test scores on the Chapter 1 Statistics test. Describe your experiment below as detailed as possible.