Part III

Sample Chapter Tests with Answers
CHAPTER 1 TEST
FORM A

1. The Colorado State Legislature wants to estimate the length of time it takes a resident of Colorado to earn a Bachelor’s degree from a state college or university. A random sample of 265 recent in-state graduates were surveyed.

(a) Identify the variable.

(b) Is the variable quantitative or qualitative?

(c) What is the implied population?

2. For the information in parts (a) through (g) below, list the highest level of measurement as ratio, interval, ordinal, or nominal and explain your choice.

A student advising file contains the following information.

(a) Name of student

(b) Student I.D. number

(c) Cumulative grade point average

(d) Dates of awards (scholarships, dean’s list, …)

(e) Declared major or undecided if no major declared

(f) A number code representing class standing:
   1 = Freshman, 2 = Sophomore, 3 = Junior,
   4 = Senior, 5 = Graduate student

(g) Entrance exam rating for competency in English:
   Excellent, Satisfactory, Unsatisfactory

3. Categorize the style of gathering data (sampling, experiment, simulation, census) described in each of the following situations.

(a) Look at all the apartments in a complex and determine the monthly rent charged for each unit.

(b) Give one group of students a flu vaccination and compare the number of times these students are sick during the semester with students in a group who did not receive the vaccination.

(c) Select a sample of students and determine the percentage who are taking mathematics this semester.

(d) Use a computer program to show the effects on traffic flow when the timing of stop lights is changed.
4. Write a brief essay in which you describe what is meant by an experiment. Given an example of a situation in which data is gathered by means of an experiment. How is gathering data from an experiment different from using a sample from a specified population?

5. Consider the experiment of rolling a single die. Describe how you would use a random number table to simulate the outcomes of rolling a single die. Using the following row of random numbers from the table, find the first five outcomes.

36017  98590  64180  72315  39710

6. Identify each of the following samples by naming the sampling technique used (cluster, convenience, simple random, stratified, systematic).

(a) Measure the length of time every fifth person coming into a bank waits for teller service over a period of two days.

(b) Take a sample of five Zip codes from the Chicago metropolitan region and use all the elementary schools from each of the Zip code regions. Determine the number of students enrolled in first grade in each of the schools selected.

(c) Divide the users of the computer online service Internet into different age groups and then select a random sample from each age group to survey about the amount of time they are connected to Internet each month.

(d) Survey five friends regarding their opinion of the student cafeteria.

(e) Pick a random sample of students enrolled at your college and determine the number of credit hours they have each accumulated toward their degree program.
CHAPTER 1 TEST
FORM B

1. A book store wants to estimate the proportion of its customers who buy murder mysteries. A random sample of 76 customers are observed at the checkout counter and the number purchasing murder mysteries is recorded.

(a) Identify the variable.
(b) Is the variable quantitative or qualitative?
(c) What is the implied population?

2. For the information in parts (a) through (e) below, list the highest level of measurement as ratio, interval, ordinal, or nominal and explain your choice.

A restaurant manager is developing a clientele profile. Some of the information for the profile follows:

(a) Gender of diners
(b) Size of groups dining together
(c) Time of day the last diner of the evening departs
(d) Age grouping: young, middle age, senior
(e) Length of time a diner waits for a table.

3. Categorize the style of gathering data (sampling, experiment, simulation, census) for the following situations.

(a) Consider all the students enrolled at your college this semester and report the age of each student.
(b) Select a sample of new pickup trucks and count the number of manufacturer defects in each of the trucks.
(c) Use computer graphics to determine the flight path of a golf ball when the position of the hand on the golf club is changed.
(d) Teach one section of English composition using a specific word processing package and teach another without using any computerized word processing. Count the number of grammar errors made by students in each section on a final draft of a 20 page term paper.
4. Write a brief essay in which you discuss some of the aspects of surveys. Give specific examples to illustrate your main points.

5. A business employs 736 people. Describe how you could get a random sample of size 30 to survey regarding desire for professional training opportunities. Identify the first 5 to be included in the sample using the following random number sequence.

   62283  14130  55790  40133  47596  17654

6. To determine monthly rental prices of apartment units in the San Francisco area, samples were constructed in the following ways. Categorize (cluster, convenience, simple random, stratified, systematic) each sampling technique described.

   (a) Number all the units in the area and use a random number table to select the apartments to include in the sample.

   (b) Divide the apartment units according to number of bedrooms and then sample from each of the groups.

   (c) Select 5 Zip codes at random and include every apartment unit in the selected Zip codes.

   (d) Look in the newspaper and consider the first sample of apartment units that list rent per month.

   (e) Call every 50th apartment complex listed in the yellow pages and record the rent of the unit with unit number closest to 200.
CHAPTER 1 TEST
FORM C

Write the letter of the response that best answers each problem.

1. A consumer research company wants to estimate the average cost of an airline ticket for a round trip within the continental United States. A random sample of 50 airfares was gathered giving an average price of $438. Identify the variable.  
   (a) Random sample of 50 airfares  (b) Airline fare  
   (c) Consumer research company  (d) Quantitative  (e) $438

2. For the information in parts A. through E., choose the highest level of measurement (or cannot determine):
   (a) Ratio  (b) Interval  
   (c) Ordinal  (d) Nominal  (e) Cannot determine

   A. Temperature of refrigerators
   B. Horsepower of racecar engines
   C. Marital status of school board members
   D. Ratings of television programs (poor, fair, good, excellent)
   E. Ages of children enrolled in a daycare

3. Categorize the style of gathering data described in each of the following situations:
   (a) Sampling  (b) Experiment  
   (c) Simulation  (d) Census  (e) Cannot determine

   A. Give one group of people a diet supplement and another a placebo. After both groups have been on the same meal program for one month, compare the weight losses of the two groups.  
   B. Use a computer program to show the effects on airline traffic flow where air traffic controllers change methods.
   C. Select a sample of consumers and determine the percentage who own cellular phones.
   D. Determine the annual income for all employees in a company.
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4. Consider the following study:

Students in a limnology class took water samples from a lake to determine the temperature at different depths. Which of the following techniques for gathering data do you think was used?  

(a) Double-blind experiment  (b) Experiment  
(c) Analysis of variance  (d) Placebo effect  (e) Observational study

5. When using a random-number table to get a list of nine random numbers from 57 to 634, you would use groups of

(a) 9 digits.  (b) 2 digits.  
(c) 1 digit.  (d) 3 digits.  (e) 2 digits and then 3 digits.

6. Identify each of the following samples by naming the sampling technique used.

(a) Cluster  (b) Convenience  
(c) Simple random  (d) Stratified  (e) Systematic

A. Every tenth customer entering a health club is asked to select his or her preferred method of exercise.  

B. Divide the subscribers of a magazine into three different income categories and then select a random sample from each category to survey about their favorite feature.

C. Take a sample of six Zip codes from the Minneapolis metropolitan region and use all the car dealerships in the selected areas. Determine the number of new cars sold each month at each dealership.

D. Use a random number table to select a sample of books and determine the number of pages in each book.

E. Determine the annual salary of each of the nurses that are on duty at the time you chose to interview at the hospital.