Date Completed: _____
Mentor Initials: _____

Sample vs. Population

1. A sample of 800 community college students was selected at random and asked how much time they spend on schoolwork each weekend. Of the students selected, 115 spend less than 1 hour on schoolwork each weekend. If this survey allowed researchers to draw the conclusion that that "approximately half a million community college students spend less than 1 hours on homework each weekend," which of the following is closest to the population, in millions, of community college students?

A) 0.14
B) 0.3
C) 3.5
D) 6.9

2. In the state of Delaware, Mrs. Cramp's seventh-grade class consisting of 24 students was surveyed and 19.6 percent of the students reported that they had at least two siblings. The average ninth-grade class size in the state is 32. If the students in Mrs. Cramp's class are representative of students in the state's seventh-grade classes and there are 800 seventh-grade classes in the state, which of the following best estimates the number of seventh-grade students in the state who have fewer than two siblings?

A) 3700
B) 5000
C) 15,400
D) 20,582

3. A researcher wants to predict how the residents of California will react to a new bill proposed in the state house. Which of the following study designs is most likely to provide reliable results for the researcher?

A) Interviewing a group of 2000 students selected at random from the students of the UC college system.
B) Mailing a questionnaire to each of 50 randomly selected residents of California.
C) Surveying a group of 500 randomly selected California residents.
D) Surveying a group of 2,500 randomly selected US residents.

4. One hundred school-district residents will be selected to participate in a survey about selecting a location for a new elementary school site. Which of the following methods of choosing the 100 members would result in a random sample of members of the school district?

A) Obtain a numbered list of all school district residents. Use a random number generator to select 100 names from the list. Give the survey to those 100 people.
B) Obtain a list of all school district members sorted alphabetically. Give the survey to the first 100 people on the list.
C) Tell all school district residents that volunteers are needed to take the survey. Give the survey to the first 100 members who volunteer.
D) Distribute the 100 surveys to the first 100 people to arrive to an upcoming school event.

5. A psychology research student was interested in seeing if a relationship existed between the number of tattoos a person has and his or her self-esteem rating. The student handed out a survey to 100 students in a lower-division psychology class. The survey had randomized questions, some of which pertained to her study, while other questions were unrelated. After collecting the survey, the researcher found no significant relationship between the number of tattoos a person has and his or her self-esteem ratings. Based on this information, which of the following is an accurate conclusion?

A) If the survey had been distributed to students in a lower division art course, it's more likely that a relationship would have existed.
B) If the researcher distributed the survey to a larger sample of citizens within the community, she would find that no relationship exists between number of tattoos and self-esteem ratings.
C) Distributing the survey to a more randomized sample of students may have produced more accurate results.
D) Creating a study with questions only pertaining to the researcher's hypothesis would have produced more accurate results.

6. Near the end of a radio news show, the host invited viewers to respond to a poll on the show's website that asked, "Do you support the new state ballot measure discussed during the show?" At the end of the show, the host reported that 18% responded "Yes," and 78% responded "No. Which of the following best explains why the results are unlikely to represent the sentiments of the population of the state?

A) The percentages do not add to 100%, so any conclusions drawn are invalid.
B) Those who responded to the poll were not a random sample of the population of the state.
C) There were not 50% “Yes” and 50% “No” responses.
D) The show did not allow enough time for the poll.

7. A study was done on the weights of different types of fish in a river. A random sample of fish were caught and marked to ensure that none were weighed more than once. The sample contained 150 salmon, of which 30% weighed more than 1 pounds. Which of the following conclusions is best supported by the sample data?

A) The majority of all fish in the river weigh less than 1 pound.
B) The average weight of all fish in the river is approximately 1 pound.
C) Approximately 30% of all salmon in the river weigh more than 1 pound.
D) Approximately 30% of all fish in the pond weigh more than 1 pound.

8. To determine the mean number of pets per household in a community, Jane surveyed 20 visitors to a local dog park. For the 20 people surveyed, the mean number of pets per household was 1.4. Which of the following is true about Jane’s survey?

A) The majority of households in the community have exactly 1 pet.
B) A determination about the mean number of pets in the community cannot be made due to a small sample size.
C) The sampling method is flawed and may produce a biased estimate of pets per household in the community.
D) The sampling method is not flawed and is likely to produce an unbiased estimate of dogs per household in the community

9. The members of a neighborhood council want to assess the opinions of all neighborhood residents about converting an open field into a new playground. The council distributed surveys at school events and at playgrounds for several weeks, ultimately receiving 500 survey responses. The survey showed that the majority of those sampled were in favor of the new playground. Which of the following is true about the council's survey?

A) It shows that the majority of neighborhood residents are in favor of the new playground.
B) The sample should have included more residents who were parents.
C) The sample should have consisted entirely of residents who do not have children.
D) The survey sample is biased because it is not representative of neighborhood residents.

10. In the fall of 2021, three studies were conducted to assess the fitness level of 9^{th} grade students in the state of Indiana. In each study, every student took the same fitness test and received a score.

The participants for the studies were selected as follows:

- For Study I, 1000 9^{th} graders were selected at random from high schools around the state.
- For Study II, 100 9^{th} graders were selected at random from all 9^{th} graders in the town of Valparaiso, IN.
- For Study III, 100 9^{th} graders from Valparaiso, IN volunteered to participate.

The results of which of the studies can be appropriately generalized to all 9^{th} graders in the state of Indiana?

A) Study I only.
B) Studies I and II only.
C) Studies II and III only.
D) Studies I, II, and III.