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Name:_____ Class:_____ Date:_____

Chapter 2

1. The sports section of the *East Mule Shoe Gazette* runs a weekly question that readers can answer online. After the local university's football squad was beaten by its rival for the forty-second straight season, the question was, "Do you think that the coach needs to go?" Of the 182 people who responded, 89 percent said *Yes*.

When people say that the newspaper poll is biased, they mean that

a. repeated polls would miss the truth about the population in the same direction.
b. the question asked shows a preference on a gender or racial basis.
c. repeated polls would give results that are very different from each other.
d. students may have different opinions than townspeople.

ANSWER: a

2. In a table of random digits,

a. each pair of digits 00, 01, 02, ..., 99 appears exactly once in any row of the table.
b. any pair of entries is equally likely to be any of the 100 possible pairs 00, 01, 02, ..., 99.
c. a specific pair such as 00 cannot be repeated until all other pairs have appeared.
d. the pair 00 can appear, but 000 is not random and can never appear in the table.

ANSWER: b

3. We select a sample in order to

a. get information about some population.
b. get information only about the sample.
c. take a census.
d. bias the results toward a certain answer.

ANSWER: a

4. Every conceivable group of people of the required size has the same chance of being the selected sample when we use a

a. voluntary response sample.
b. census.
c. simple random sample.
d. convenience sample.

ANSWER: c

5. A statistics recitation has 30 students. The presenter wants to call a simple random sample (SRS) of five students from the recitation to ask where they use a computer for the online exercises. The presenter labels the students 01, 02, …, 30 and enters the table of random digits at this line:

09731 03453 76165 39241 87853 32459 26056 31424 80371 65103 62253 22490 61181

The SRS contains the students labeled:

a. 09, 73, 10, 34, 53. 26.
b. 09, 10, 34, 16, 24.

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c. 09, 10, 16, 24,
d. 09, 10, 16, 24, 24.
e. 09, 07, 03, 10, 04.

ANSWER: c

6. The website randomizer.org is used to select 30 students without repetition from a statistics class with 135 members to rate a statistics video. These 30 students are
a. a simple random sample of the class.
b. the population.
c. a census.
d. a voluntary response sample.

ANSWER: a

7. A table of random numbers is used to select 30 students from a statistics class to rate a statistics video. The ratings that these students give are used to estimate the ratings that would be given if the entire class were asked to rate the video. This type of sample is
a. a biased sample.
b. a convenience sample.
c. a census.
d. voluntary response sample.
e. a sample that avoids bias.

ANSWER: e

8. For a sample to be a simple random sample of size *n*,
a. the variability must be small.
b. *n* must be a large number.
c. every item in the population must be selected.
d. every collection of *n* individuals must have the same chance to be the sample actually chosen.
e. the size of the population must be smaller than *n.*

ANSWER: d

9. When Ann Landers asked her readers to tell her "if your sex life has gone downhill after marriage," more than 100,000 people responded. This is an example of
a. a voluntary response sample.
b. an experiment.
c. a simple random sample.
d. a census.

ANSWER: a

You want to take an SRS of 50 of the 816 students who live in a college dormitory. You label the students 001 to 816 in alphabetical order. In the table of random digits, you read the entries

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96746 12149 37823 71868 18442 35119 62103 39244

10. The first three students in your sample have labels
    a. 967, 461, 214. 937.
    b. 967, 121, 378.
    c. 461, 214,
    d. 461, 214, 718.
    e. 674, 612, 149.

ANSWER: d

11. Another valid choice of labels for the 816 students is
    a. 000 to 816 in alphabetical order.
    b. 001 to 816 in order of the student ID numbers.
    c. 000 to 815 in alphabetical order.
    d. Both B and C are correct.
    e. Answers A, B, and C are correct.

ANSWER: d

12. Which of the following statements about the table of random digits is true?
    a. Every row must have exactly the same number of 0s and 1s.
    b. In the entire table, there are exactly the same number of 0s and 1s.
    c. If you look at 100 consecutive pairs of digits anywhere in the table, exactly one pair is 00.
    d. All of these are true.
    e. None of these are true.

ANSWER: e

13. Which of the following is *not* true of an SRS of size 1000 chosen from a population of size 4 million?
    a. Every individual of the population has chance 1-in-1000 of being included in the sample.
    b. Every set of 1000 individuals has the same chance of being the sample as every other set of 1000 individuals.
    c. Every individual in the population has the same chance of selection as every other individual.
    d. Every pair of individuals has the same chance of being included in the sample as every other pair of individuals.

ANSWER: a

14. Voluntary response polls almost always suffer from
    a. low bias.
    b. high bias.
    c. no bias.
    d. randomization.

ANSWER: b

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15. A table of random numbers is used to select 25 students from a large class to rate a new single by Beyoncé. The ratings that these students give are used to estimate the ratings that would be given if the entire class were asked to rate the song. This type of sample is a

a. convenience sample.
b. census.
c. simple random sample.
d. biased sample.
e. voluntary response sample.

ANSWER: c

16. *Bias* in a sampling method is

a. any error in the sample result, that is, any deviation of the sample result from the truth about the population.
b. the random error due to using chance to select a sample.
c. any error due to practical difficulties such as contacting the subjects selected.
d. any systematic error that tends to occur in the same direction every time you use this sampling method.
e. racism or sexism on the part of those who take the sample.

ANSWER: d

17. An editorial writer for the *East Mule Shoe Gazette* wants to measure public support for a discontinued construction project that has left a city-block-size hole in the middle of the East Mule Shoe downtown area. So, one day he uses his lunch hour to walk down the block adjacent to the project and interview the first 25 people who will talk to him about it. The newspaper asks readers to comment on its survey of local opinion. Readers say that

a. this is a simple random sample. It gives very accurate results.
b. this is a simple random sample. The results are not biased, but the sample is so small that variation will be high.
c. this is a census because all citizens had a chance to be asked. It gives very accurate results.
d. the sampling method is biased. It will almost certainly overestimate the level of support among all East Mule Shoe residents.
e. the sampling method is biased. It will almost certainly underestimate the level of support among all East Mule Shoe residents.

ANSWER: d

18. A(n) ____ is the subset of units that the experimenter actually measures.

a. individual
b. population
c. sample
d. survey

ANSWER: c

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19. The mayor's office wants to know how people in the city feel about the condition of the city's roads. They place an announcement in the newspaper asking residents to email their opinions to the mayor's office. Five hundred people send emails, and about 84 percent of the responses indicate displeasure with the condition of the city's roads.

a. This is a simple random sample. It gives very accurate results.
b. This is a simple random sample. The results are not biased, but the sample is so small that variation will be high.
c. This is a census because all city residents had a chance to provide their opinions. It gives very accurate results.
d. This is a voluntary response sample. It will almost certainly overestimate the level of displeasure among the city's residents.
e. This is a voluntary response sample. It will almost certainly underestimate the level of displeasure among the city's residents.

ANSWER: d

20. A teacher writes the names of her 30 students on small pieces of paper and places them into a box. She then draws out five names to select students to participate in a survey. These five students are

a. a census.
b. the population.
c. an SRS of the class.
d. a voluntary response sample.

ANSWER: c

21. The president of a university sends surveys to and receives answers from all 21 board members to better understand their positions about upcoming budget issues. These 21 board members are

a. a census.
b. the population.
c. an SRS of the board.
d. a voluntary response sample.

ANSWER: a

Suppose you want to take an SRS sample of size 6 from the 20 participants in your Zumba exercise class. You label the students 01 to 20 in alphabetical order by last name. In the table of random digits, you read the entries

45149 32992 75730 66280 03819 56202 02938 70915

22. The six participants in your selected sample have labels

a. 45, 14, 93, 29, 92, 75.
b. 14, 06, 03, 02, 02, 09.
c. 14, 06, 03, 02, 09, 15.
d. 14, 06, 03, 19, 02, 09.

ANSWER: c

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23. Another valid choice of labels for the 20 participants is
    a. 36 to 55 in alphabetical order by last name.
    b. 01 to 20 in reverse alphabetical order by last name.
    c. five labels for each person (00–04, 05–09, 10–14, …, 95–99) assigned in alphabetical order by last name.
    d. Both A and B are correct.
    e. Answers A, B, and C are correct.

ANSWER: e

24. Which of these statements about a table of random digits is true?
    a. No two-digit number appears more than once in a given row.
    b. It is not possible for 00000 (five zeros in a row) to appear in the table.
    c. It is possible for five consecutive digits (e.g., 12345) to appear in the table.
    d. All of these are true.
    e. None of these are true.

ANSWER: c

A local talk radio station conducts a poll to determine if its listeners favor or oppose the president's proposed actions on judicial appointments. To express their opinions, listeners are asked to call, email, or text-message the radio station. The poll results in 89.38 percent of the responders opposing the proposed judicial appointments.

25. What type of sampling was used in this situation?
    a. This is a convenience sample.
    b. This is a voluntary response sample.
    c. This is a census.
    d. This is an SRS.

ANSWER: b

26. In this situation, 89.38 percent result is
    a. likely to overestimate the true percentage because, typically, only people with strong (and usually negative) opinions will respond.
    b. likely to underestimate the true percentage because, typically, only people with strong (and usually positive) opinions will respond.
    c. exact since it came from a census.
    d. very accurate because it came from an SRS.

ANSWER: a

27. This type of sampling uses the idea of "drawing names out of a hat" to produce a sample of individuals.
    a. biased
    b. convenience

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c. simple random
d. voluntary response

ANSWER: c

For a class project, you want to survey students at your school for their opinions about the importance of studying. You go to the campus library and survey 200 students as they are leaving the library.

28. What type of sampling was used in this situation?
a. This is a simple random sample.
b. This is a convenience sample.
c. This is a voluntary response sample.
d. This is a census.

ANSWER: b

29. In this situation, your survey results will
a. be exact because the information came from a census.
b. likely be biased because, typically, only people with strong opinions will participate.
c. likely be biased because most students leaving the library were there to study.
d. be very accurate because the information came from an SRS.

ANSWER: c

30. Voluntary response sampling occurs when
a. you volunteer to collect survey responses from randomly selected people.
b. you choose the people in your classroom to participate in a survey.
c. you use a table of random digits to choose people to participate in a survey.
d. you put up signs on campus asking people to send you an email with their opinions on certain issues.

ANSWER: d

31. A sportswriter wants to know how strongly local residents support building a new stadium for the local minor league baseball team. She prints a survey in her column and asks her readers to send in their response. This is an example of
a. simple random sampling.
b. stratified sampling.
c. probability sampling.
d. voluntary response sampling.

ANSWER: d

32. If a sampling method has too much bias, then
a. we need to improve the sampling method to decrease the bias.
b. we need to increase the sample size to decrease the bias.
c. we should sample from a larger population to decrease the bias.

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d. None of the above will help decrease the bias of a sampling method.

ANSWER: a

33. Suppose a college wants to take a random sample of five professors from the Math Department to participate in a survey.

Professor names, in alphabetical order by last name

Numerical Label	Name	Numerical Label	Name	Numerical Label	Name	Numerical Label	Name
	Betzel		James		Minor		Shew
	Boyer		Lickeri		Mueller		Smith
	Duda		Luebben		Nedel		Starin
	Gutman		MacLean		Rensi		Thompson
	Hatfield		Marketos		Seidel		Xu

You label the professors 01 to 20 in alphabetical order by last name. In the table of random digits, you read the entries

19223 95034 05756 28713 96409 12531 42544 82853 03185

The five participants in your selected sample have labels

a. 19, 05, 13, 03, 18.
b. 19, 22, 39, 50, 34.
c. 1, 9, 2, 3, 5
d. 01, 09, 02, 03, 05

ANSWER: a

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