



Name: _____ Course Number: _____ Section Number: _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

- 1) Define the terms population, sample, parameter and statistic. How does a census compare to a sample?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Identify the number as either continuous or discrete.

- 2) The total number of phone calls a sales representative makes in a month is 425.
A) Continuous B) Discrete
- 3) The number of limbs on a 2-year-old oak tree is 21.
A) Continuous B) Discrete

Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.

- 4) The subjects in which college students major.
A) Ratio B) Ordinal C) Nominal D) Interval
- 5) Amount of fat (in grams) in cookies.
A) Nominal B) Interval C) Ordinal D) Ratio

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Identify the sample and population. Also, determine whether the sample is likely to be representative of the population.

- 6) In a poll of 50,000 randomly selected college students, 74% answered "yes" when asked "Do you have a television in your dorm room?"

Use critical thinking to develop an alternative conclusion.

- 7) A study shows that adults who work at their desk all day weigh more than those who do not.
Conclusion: Desk jobs cause people to gain weight.

Use critical thinking to address the key issue.

- 8) A questionnaire is sent to 10,000 persons. 5,000 responded to the questionnaire. 3,000 of the respondents say that they "love chocolate ice cream". We conclude that 60% of people love chocolate ice cream. What is wrong with this survey?
- 9) A researcher wished to gauge public opinion on gun control. He randomly selected 1000 people from among registered voters and asked them the following question: "Do you believe that gun control laws which restrict the ability of Americans to protect their families should be eliminated?". Identify the abuse of statistics and suggest a way the researcher's methods could be improved.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a percent, if necessary.

10) Convert 0.34 to an equivalent fraction and percent.

- A) $\frac{8}{25}$, 34% B) $\frac{8}{25}$, 3.4% C) $\frac{17}{50}$, 3.4% D) $\frac{17}{50}$, 34%

Solve the problem.

11) A gardener has 28 clients, 25% of whom are businesses. Find the number of business clients.

- A) 7000 clients B) 700 clients C) 7 clients D) 70 clients

Is the study experimental or observational?

12) A marketing firm does a survey to find out how many people use a product. Of the one hundred people contacted, fifteen said they use the product.

- A) Experimental B) Observational

13) A clinic gives a drug to a group of ten patients and a placebo to another group of ten patients to find out if the drug has an effect on the patients' illness.

- A) Observational B) Experimental

Identify the type of observational study.

14) A statistical analyst obtains data about ankle injuries by examining a hospital's records from the past 3 years.

- A) Retrospective B) Cross-sectional C) Prospective D) None of these

Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

15) A tax auditor selects every 1000th income tax return that is received.

- A) Random
B) Systematic
C) Convenience
D) Cluster
E) Stratified

16) A pollster uses a computer to generate 500 random numbers, then interviews the voters corresponding to those numbers.

- A) Stratified
B) Cluster
C) Convenience
D) Systematic
E) Random

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

17) Define random sample. Explain why this is important in design of experiments.

- 18) Define sampling error and nonsampling error. Give examples of nonsampling error.

- 19) A market researcher obtains a sample of 50 people by standing outside a store and asking every 20th person who enters the store to fill out a survey until she has 50 people. What sampling method is being used here? Will the resulting sample be a random sample? Will it be a simple random sample? Explain your thinking.

- 20) Explain the difference between stratified and cluster sampling.

Answer Key

Testname: ELEMENTARY STATISTICS CHAPTER 1 TEST FORM A

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 1) A population is the complete collection of all elements. A sample is a subset of elements drawn from a population. A parameter is a numerical measurement describing some characteristic of a population. A statistic is a numerical measurement describing some characteristic of a sample. A census is the collection of data from every element in a population; a sample is a subset of a population.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 2) B
- 3) B
- 4) C
- 5) D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 6) Sample: the 50,000 selected college students; population: all college students; representative
- 7) Desk job workers are confined to their chairs for most of their work day. Other jobs require standing or walking around which burns calories. It is probably the lack of exercise that causes higher weights, not the desk job itself. Avoid causality altogether by saying lack of walking and exercise is associated with higher weights.
- 8) This is not a random sample. The survey is based on voluntary, self-selected responses and therefore has serious potential for bias.
- 9) The question is loaded. A more neutral way to phrase the question would be, for example, "Do you believe that gun control laws should be strengthened, weakened, or left in their current form?"

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 10) D
- 11) C
- 12) B
- 13) B
- 14) A
- 15) B
- 16) E

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 17) In random sampling, each member of the population has an equal chance of being selected. Random sampling provides us with the best representative sample in which all groups of the population are approximately proportionately represented. Careless sampling can easily result in a biased sample which may be useless.
- 18) Sampling error is the difference between a sample result and the true population result. Such an error results from chance sample fluctuations. A nonsampling error occurs when the sample data are incorrectly collected, recorded, or analyzed. Examples include nonrandom samples, defective measuring instruments, biased survey questions, a large number of refusals, copying sample data incorrectly.
- 19) This is systematic sampling. The sample obtained will be a random sample because everyone has the same chance of being chosen but will not be a simple random sample as different samples of 50 people have different chances of being chosen. Specifically, the sample is random because each person has one chance in twenty of being selected. The sample is not simple random because different samples of size 50 by this design have different chances of being selected due to the numbers of people arriving at the store at different times.

Answer Key

Testname: ELEMENTARY STATISTICS CHAPTER 1 TEST FORM A

- 20) In both cluster sampling and stratified sampling, sub-groups (clusters or strata) are formed. However, in stratified sampling, all strata are used and a sample is selected from each strata. In cluster sampling, a sample of the clusters is first selected, then all members of those clusters are selected.

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SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**Provide an appropriate response.**

- 1) Distinguish between qualitative and quantitative data. Give an example for each.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**Determine whether the given value is a statistic or a parameter.**

- 2) After taking the first exam, 15 of the students dropped the class.

A) Statistic

B) Parameter

- 3) A sample of 120 employees of a company is selected, and the average age is found to be 37 years.

A) Statistic

B) Parameter

Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.

- 4) The sample of spheres categorized from softest to hardest.

A) Ordinal

B) Nominal

C) Ratio

D) Interval

- 5) Temperatures of the ocean at various depths.

A) Interval

B) Ordinal

C) Nominal

D) Ratio

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**Identify the sample and population. Also, determine whether the sample is likely to be representative of the population.**

- 6) 100,000 randomly selected adults were asked whether they drink at least 48 oz of water each day and only 45% said yes.

Use critical thinking to develop an alternative conclusion.

- 7) In a study of headache patients, every one of the study subjects with a headache was found to be improved after taking a week off of work. Conclusion: Taking time off work cures headaches.

Use critical thinking to address the key issue.

- 8) A researcher published this survey result: "74% of people would be willing to spend 10 percent more for energy from a non-polluting source". The survey question was announced on a national radio show and 1,200 listeners responded by calling in. What is wrong with this survey?
- 9) "38% of adults in the United States regularly visit a doctor". This conclusion was reached by a college student after she had questioned 520 randomly selected members of her college. What is wrong with her survey?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a percent, if necessary.

10) Convert 8.4% to an equivalent fraction and decimal.

- A) $\frac{2}{25}$, 0.84 B) $\frac{21}{250}$, 0.84 C) $\frac{2}{25}$, 0.084 D) $\frac{21}{250}$, 0.084

Solve the problem.

11) Alex and Juana went on a 120-mile canoe trip with their class. On the first day they traveled 30 miles. What percent of the total distance did they canoe?

- A) 4% B) 0.25% C) 25% D) 400%

Is the study experimental or observational?

12) A political pollster reports that his candidate has a 10% lead in the polls with 10% undecided.

- A) Experimental B) Observational

13) A T.V. show's executives commissioned a study to gauge the impact of the show's ratings on the sales of its advertisers.

- A) Observational B) Experimental

Identify the type of observational study.

14) A researcher plans to obtain data by following those in cancer remission since January of 2002.

- A) Cross-sectional B) Retrospective C) Prospective D) None of these

Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

15) A sample consists of every 49th student from a group of 496 students.

- A) Stratified
B) Random
C) Cluster
D) Systematic
E) Convenience

16) The name of each contestant is written on a separate card, the cards are placed in a bag, and three names are picked from the bag.

- A) Cluster
B) Random
C) Stratified
D) Convenience
E) Systematic

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use critical thinking to address the key issue.

17) "7 out of 10 dentists recommend Brand X toothpaste". This finding is based on the results of a survey of 10 randomly selected dentists. What is wrong with this survey?