Seeing Through Statistics 5th edition Utts Test Bank

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Name:_____ Class:_____ Date:_____

Chapter 1

1. Which of these does not apply to the word ‘statistics’?

a. Statistics are numbers measured for some purpose.
b. Statistics is a collection of procedures for collecting and analysing data.
c. Statistics is a tool to help you make decisions when faced with uncertainty.
d. All of the provided statements apply to the word ‘statistics’.

ANSWER: d

2. Which of the following questions cannot be addressed using statistics?

a. What percentage of people in the U.S. are cell phone owners?
b. Which of these two medicines has a better success rate at lowering cholesterol?
c. Do mothers most often hold their babies in their arms, so the baby is on the left side?
d. All of the provided questions can be addressed using statistics.

ANSWER: d

3. Which of the following is not true about the subject of statistics?

a. Statistics only represents numbers that are used for a specific purpose.
b. Statistics is a collection of procedures and principles for dealing with information.
c. Statistics appears in your every day life.
d. Statistics has a great deal to do with decision making in the face of uncertainty.

ANSWER: a

4. Which of the following is not a misuse of statistics?

a. Taking a statistic out of context.
b. Neglecting to take the proper units into account (such as crime rate vs. number of crimes).
c. Reporting a number that you didn’t expect.
d. All of these are examples of misleading statistics.

ANSWER: c

5. Statistics is about collecting information and using it to help you make a decision. Which of the following is a good example of a decision that could be made using statistics?

a. Somebody selects the team that is going to get the Stanley Cup this year.
b. Somebody looks for the grocery store closest to his home.
c. Somebody chooses the tastiest ice cream in the cafe.
d. Somebody decides how much salt to put in the stew cooking.

ANSWER: a

6. Select an example of how you have used statistics in your own life.

a. To decide how to get a ball into the net, I consulted statistics of projectile motion.
b. To decide which color of jacket to choose, I consulted statistics from fashion journals.

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c. To decide what brand of computer to buy, I consulted statistics from consumer reports.
d. To decide at what temperature the water boils, I consulted the statistics of water properties

ANSWER: c

7. _____ is a collection of procedures and principles for gaining and analyzing information in order to help people make decisions when faced with uncertainty.

a. Calculus
b. Statistics
c. Analytics
d. Topology

ANSWER: b

8. Statistics is a collection of procedures and principles for gaining and analyzing information in order to help people make decisions when faced with _____.

a. causality
b. anxiety
c. predictability
d. uncertainty

ANSWER: d

9. Select the area in which the study of statistics is useful for everyday life.

a. Precise machining
b. Haute cuisine
c. Plumbing and pipelines
d. Weather prediction

ANSWER: d

10. The conclusions that can be drawn from an observational study are not as strong as the conclusions that can be drawn from a(n) _____.

a. randomized experiment
b. personal observation
c. anecdotal evidence
d. scientific hypothesis

ANSWER: a

11. Explain the difference between the statistical terms "population" and "sample".

a. A population is all subjects interfering with the group for which you plan to draw conclusions. A sample is the entire group for which you plan to draw conclusions.
b. A population is the group that is actually studied. A sample is a part of the studied group, either treatment of control.
c. A population is the entire group for which you plan to draw conclusions. A sample is a group that is actually

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studied, and is chosen from the population.

d. A population is the entire group for which you plan to draw conclusions. A sample is a part of the studied group, either treatment of control.

ANSWER: c

12. Most statistical studies fall into one of two types, either an observational study or a randomized _____.

a. correlation
b. survey
c. sample
d. experiment

ANSWER: d

13. Researchers at the University of Iowa College of Medicine reported that a test showed that those who smoked seven or more marijuana joints per week had lower math scores than non-marijuana users. A related headline says "New study confirms too much pot impairs brain". Why these results must have been based on an observational study, and not an experiment?

a. People cannot be randomly assigned to either smoke marijuana or not.
b. The headline does not correspond to the results of the test.
c. The measured value is qualitative, not quantitative.
d. The math test is not a good measurement of the state of the brain.

ANSWER: a

14. Suppose a recent study of 1,000 teenagers in the U.S. found that 33% of them do babysitting to earn extra money. Which of the following describes the population for this example?

a. All teenagers in the U.S.
b. The 1,000 teenagers who participated in the study.
c. All teenagers in the U.S. who do babysitting for extra money.
d. The 33% of teenagers who do babysitting to earn extra money.

ANSWER: a

15. Suppose a recent study of 1,000 teenagers in the U.S. found that 33% of them do babysitting to earn extra money. Which of the following describes the sample for this example?

a. All teenagers in the U.S.
b. The 1,000 teenagers who participated in the study.
c. All teenagers in the U.S. who do babysitting for extra money.
d. The 33% of teenagers who do babysitting to earn extra money.

ANSWER: b

16. Which of the following is <u>not</u> an example of a situation involving statistics?

a. A pie chart showing the percentage of males and females in your class.
b. A designed experiment comparing the heights of left-handed vs. right-handed people.

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c. A survey asking your opinion of whether or not college football players should be paid to play football.
d. A table in a physics textbook showing the densities of materials.

ANSWER: d

17. Suppose you want to determine whether taking vitamins every day helps people lose weight. You survey 200 people who had been on a weight loss program for six months, and ask them whether or not they take vitamins every day, and how much weight they lost. Suppose you found that the people who lost the most weight were more likely to have been taking vitamins every day. Does this mean vitamins caused the additional weight loss? Explain why or why not.

a. No; this was a randomized experiment, not an observational study. Other factors could explain the weight loss, such as a healthy lifestyle (health conscious people may be more likely to take vitamins).
b. No; this was an observational study, not a controlled experiment. Other factors could explain the weight loss, such as a healthy lifestyle (health conscious people may be more likely to take vitamins).
c. Yes; this was an observational study, not a randomized experiment. Vitamins cause additional weight loss since the vitamins enhance the work of the digestive system.
d. Yes; this was an observational study, not a controlled experiment. Vitamins cause additional weight loss since the vitamins enhance the work of the digestive system.

ANSWER: b

18. Why can't you make causal connections with an observational study?

a. Cause-and-effect conclusions cannot be made by only statistical methods, since such conclusions require determinism, and statistical methods are designed for the cases of uncertainty, not determinism.
b. An observational study requires much more efforts for each subject of the study, which results in smaller samples for observational studies than for randomized experiments. A smaller sample implies weaker conclusions.
c. An observational study does not control for other variables that may influence the outcome. That means there may be other factors that the researchers did not measure that could account for any connections found.
d. An observational study measures qualitative values, not quantitative values. Quantitative values are required to make any legitimate cause-and-effect conclusions.

ANSWER: c

19. Researchers at the University of Iowa College of Medicine reported that a test showed those who smoked seven or more marijuana joints per week had lower math scores than non-marijuana users. A related headline says "New study confirms too much pot impairs brain". Explain why the headline is misleading.

a. While the wording is not very scientific, such a headline could be derived from the results of the test.
b. It implies that there is a causal connection between math scores and brain function. The scores of math tests are not a good way to make conclusions about brain function.
c. It does not correspond to the result of the test. Researches did not show that the difference between test results is significant.
d. It implies that there is a causal connection between smoking marijuana and brain function. It could be the case that people who choose to smoke marijuana are those who would score lower on the tests anyway.

ANSWER: d

20. While you can learn a lot about the world just by observing it, you can learn even more by conducting a carefully controlled experiment involving statistics. Why?

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a. A controlled experiment allows you to make careful comparisons to find out if differences really do exist, and if so, to attribute a cause for the differences.
b. A controlled experiment allows you to get information about significantly greater samples of subjects, so your conclusions would be applicable for an entire population.
c. A controlled experiment allows you to get quantitative results, while an observation provides only qualitative results.
d. A controlled experiment allows you to find smaller differences than the observation does.

ANSWER: a

21. Suppose researchers who conducted a vitamin study conclude in an evening news sound bite that "Daily vitamin use is good for everyone." You get a copy of the study they referred to, and find that the participants were all healthy young males who exercised regularly. Why is the headline misleading from a statistical standpoint?

a. The wording of the headline does not use scientific language.
b. The study is a randomized experiment, not an observational study. Cause-and-effect conclusions cannot be made from randomized experiments.
c. The study does not attribute a difference for participants who used and did not use vitamins daily.
d. The conclusion in the headline should not refer to everyone. The results only apply to healthy young males who exercise regularly.

ANSWER: d

22. Which of the following statements is true?

a. The more variable the groups within a population are, the larger the sample needs to be to detect any real difference between the groups.
b. The more variable the groups within a population are, the smaller the sample needs to be to detect any real difference between the groups.
c. No matter how variable the groups within a population are, the size of the sample needed to detect a real difference between the groups is the same.
d. None of the provided statements are true.

ANSWER: a

23. Which of the following is necessary to conduct a study properly?

a. Get a representative sample.
b. Get a large enough sample.
c. Decide whether or not the study should be an observational study or a randomized (controlled) experiment.
d. All of the provided concepts are necessary to conduct a study properly.

ANSWER: d

24. To conduct a good statistical study, you have to be sure that your _____ is representative and large enough.

a. sample
b. population
c. uncertainty
d. team

ANSWER: a

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25. Suppose you want to determine how Americans feel about reality TV. Which of the following samples contains the least amount of bias?

a. All the people who phone in their opinion on reality TV to a CBS Evening News call-in poll.
b. All those who were randomly selected to receive a reality TV survey in the mail.
c. People who call the networks during reality TV programs to voice their opinion.
d. People who respond to an Internet survey at www.realitytv.com.

ANSWER: b

26. Suppose you want to conduct a survey to determine who is most likely to win the next presidential election. Which of the following would be considered to be a representative (unbiased) sample?

a. 1,000 likely voters who called in to a local radio talk show.
b. 1,000 likely voters who returned surveys sent to everyone on a Democrat or Republican newsletter mailing list.
c. 1,000 likely voters who replied to an Internet website survey.
d. None of provided samples can be considered representative or unbiased.

ANSWER: d

27. Suppose you are conducting an experiment that involves assigning each of 100 participants to one of two groups: Group A or Group B. Which of the following would not be considered to be a random assignment of participants to groups?

a. For each participant, flip a coin. If the coin lands heads up, assign the participant to Group A. If the coin lands tails up, assign the participant to Group B.
b. Put all 100 names in a hat and mix them up thoroughly. Draw 50 names from the hat and assign them to Group A. Everyone else is assigned to Group B.
c. As the participants show up for the study, assign the first 50 of them to Group A, and the last 50 to Group B.
d. All of the provided methods are considered to be random assignments of participants to groups.

ANSWER: c

28. Suppose you wanted to find out what percentage of all Americans approve of the job the president is doing and you mailed questionnaires to 2,000 readers of The Wall Street Journal and compiled the results. This is a(n) _____ sample of all American voters.

a. representative
b. random
c. biased
d. controlled

ANSWER: c

29. Suppose you participate in an 'instant poll' on an Internet website which asks, "What is your favorite network TV program aired at 8 pm (Eastern time) on Thursday nights?" After answering the question, you look at the results of the entire poll, and find that 6,423 people have responded to it. Should the results of this poll be a good indicator of what the most popular network TV program is on Thursday nights at 8pm (Eastern time)? Explain why or why not.

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a. No. The sample of 6,423 people is a convenience sample and is not a representative sample of the population of all TV watchers.
b. No. The sample of 6,423 people is too small to make a conclusion for the population of all TV watchers.
c. Yes. The sample of 6,423 people is a representative sample of the population of all TV watchers.
d. Yes. While the sample of 6,423 people is a convenience sample, it is large enough to represent the population of all TV watchers.

ANSWER: a

30. Suppose it is reported that the state of Texas has the highest number of tornadoes in the U.S. each year, and thus it is more dangerous to live in Texas than other states if you are worried about tornadoes. Explain why these results are misleading and how they need to be recalculated.

a. The number of tornadoes is not related to the danger of tornadoes.
b. The study does not take into account the aftermath of the tornadoes. A tornado in another state can cause much severe aftermath.
c. The study does not take into account the weather differences in the states. The results should be recalculated taking into account seasonal weather patterns.
d. Texas is an extremely large state, and therefore has a greater chance of having more tornadoes. The statistic needs to be based on a "per square mile" rating.

ANSWER: d

31. Among Latino Americans, which of the following is expected to show the *least* natural variability?

a. Annual income
b. Religion
c. Language
d. Age

ANSWER: c

32. Which of the following (hypothetical) newspaper headlines is most likely based on the results of a controlled experiment?

a. The new vaccine is approximately 20% more effective than the old one.
b. 42% of citizens are against the health care reform.
c. In the previous year, 30% more tourists visited the town, compared to the year before.
d. Internet streaming viewers increased by 25% in the last year.

ANSWER: a

33. Which of the following questions can't be answered using an observational study only?

a. What percentage of people in the U.S. are cell phone owners?
b. Which of these two medicines has a better success rate at lowering cholesterol?
c. Do mothers most often hold their babies in their arms, so the baby is on the left side?
d. Where do more people visit church regularly, in the suburbs or in the city?

ANSWER: b

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34. On a news website, which of the following categories probably would contain information addressed by statistics?

a. Politics
b. Economics
c. Sport
d. Any of the provided categories can contain information addressed by statistic.

ANSWER: d

35. Which of the following topics would require the largest sample size for an observational study?

a. Road traffic collision rate in a relatively small district
b. The efficiency of a new calculus textbook
c. Religious pluralism in a large European country
d. Pizza topping preferences in a local shop

ANSWER: c

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