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Instructor: Darryl Alien Assignment: Homework I
Course: Elementary Statistics 60157
Book: Triola: Elementary Statistics, 11th ed

1. What is a voluntary response sample? Choose the correct answer below.
 - a. A sample in which the researchers decide which subjects to include in the study.
 - b. A sample in which the subjects themselves decide whether to be included in the study.
 - c. A sample in which the response “No Opinion” or “Not Applicable” are choices.
 - d. A sample in which the sample size is very large.

2. Use common sense to determine whether the given event is either impossible, possible but very unlikely, or possible and likely. San Francisco beat Seattle in a football game by a score of 135 to 99. Choose the correct answer below.
 - a. Possible, but very unlikely
 - b. Impossible
 - c. Possible and likely

3. Use common sense to determine whether the given event is either impossible, possible but very unlikely, or possible and likely. When each of 23 statistics students turns on his or her graphing calculator, all 23 calculators operate successfully. Choose the correct answer below.
 - a. Possible, but very unlikely
 - b. Possible and likely
 - c. Impossible

4. In a study of a weight loss program, 35 subjects lost a mean of 3.1 lbs after 12 months. Methods of statistics can be used to show that if this diet had no effect, the likelihood of getting these results is roughly 323 chances in 1,000.
Does the weight loss program have statistical significance?
 - a. No, because the results are unlikely to occur by chance.
 - b. No, because the results are likely to occur by chance.
 - c. Yes, because the results are likely to occur by chance.
 - d. Yes, because the results are unlikely to occur by chance.
Does the weight loss program have practical significance?
 - a. No, the results have a chance to occur even if the weight loss program had no effect. Yes, the results are too unlikely to occur by chance.
 - b. No, someone starting a weight loss program would likely want to lose considerably more than 3.1 lb.
 - c. Yes, the amount of lost weight is large enough to be considered practically significant.

5. A study compared surgery and splinting for subjects suffering from carpal tunnel syndrome. It was found that among 71 patients treated with surgery, there was a 90% success rate. Among 82 patients treated with splints, there was a 73% success rate. Calculations using those results showed that if there really is no difference in success rates between surgery and splints, then there is about 1 chance in 1000 of getting success rates like the ones obtained in this study. Complete parts (a) through (d).
Should we conclude that surgery is better than splints for the treatment of carpal tunnel syndrome?
 - a. Yes, surgery appears to have a substantially better success rate.
 - b. No, there is not enough information given to make a conclusion.
 - c. No, there is no statistical difference between the success rates.
 - d. Yes, the chance of getting a similar success rate is very small.
Does the result have statistical significance? Why or why not?
 - a. No, the difference in success rates is too small to be considered statistically significant. No, the results have a chance to occur if there is no real difference in the success rates.
 - a. Yes, the given success rates are too unlikely to occur by chance if there is no difference between the two treatment methods.
 - b. Yes, the difference in success rates is large enough to be considered practically significant.
Does the result have practical significance?
 - a. No, the results have a chance to occur even if there is no difference between the two treatment methods.
 - b. Yes, the given success rates are too unlikely to occur by chance if there is no difference between the two treatment methods.
 - c. Yes, the difference in success rates is large enough to be considered practically significant. No, the difference in success rates is not large enough to be considered practically significant.
Should surgery be the recommended treatment for carpal tunnel syndrome?
 - a. Yes, it is easier to perform surgery than to use splints.
 - b. No, there is not a practically significant difference in the success rates.
 - c. Yes, surgery appears to have a substantially higher success rate than splints. No, there is not a statistically significant difference in the success rates.

6. How do a parameter and a statistic differ? Choose the correct answer below.
 - a. A parameter is a qualitative measurement of a sample a statistic is a qualitative measurement of a population.
 - b. A parameter is a qualitative measurement of a population; a statistic is a qualitative measurement of a sample.
 - c. A parameter is a numerical measurement of a population; a statistic is a numerical measurement of a sample.
 - d. A parameter is a numerical measurement of a sample; a statistic is a numerical measurement of a population.

7. A particular country has 50 total states. If the areas of all 50 states are added and the sum is divided by 50, the result is 210,440 square kilometers. Determine whether this result is a statistic or a parameter. Choose the correct answer below.
- The result is a statistic because it describes some characteristic of a sample.
 - The result is a statistic because it describes some characteristic of a population.
 - The result is a parameter because it describes some characteristic of a population.
 - The result is a parameter because it describes some characteristic of a sample.
8. Determine whether the given value is a statistic or a parameter. In a study of all 3549 students at a college, it is found that 459 own a vehicle. Choose the correct statement below.
- Statistic because the value is a numerical measurement describing a characteristic of a sample.
 - Statistic because the value is a numerical measurement describing a characteristic of a population.
 - Parameter because the value is a numerical measurement describing a characteristic of a population.
 - Parameter because the value is a numerical measurement describing a characteristic of a sample.
9. Determine whether the value is from a discrete or continuous data set. Weight of gravel in a pile is 120 lb. Is the value from a discrete or continuous data set?
- Discrete
 - Continuous
10. Determine whether the value given below is from a discrete or continuous data set. In a test of a method of gender selection, 653 couples used the XSORT method and 441 of them had baby girls. Choose the correct answer below.
- A continuous data set because there are infinitely many possible values
 - A discrete data set because there are infinitely many possible values
 - A discrete data set because the possible values can be counted
 - A continuous data set because the possible values can be counted
11. Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate. Weight of a child: 50 lbs. 54 lbs. 58 lbs. 62 lbs. and 66 lbs. Choose the correct answer below.
- Ratio
 - Interval
 - Ordinal
 - Nominal
12. Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate. Companies that produced movies in 2007. Choose the correct answer below.
- The ratio level of measurement is most appropriate because ratios are meaningful, and there is also a natural zero.
 - The ordinal level of measurement is most appropriate because categories are ordered, but differences cannot be found or are meaningless.
 - The interval level of measurement is most appropriate because differences are meaningful, but there is no natural zero.
 - The nominal level of measurement is most appropriate because data cannot be arranged in an ordering scheme.
13. Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate. Letter grades in a math course. Choose the correct level of measurement.
- Ratio
 - Ordinal
 - Nominal
 - Interval
14. The Gallup Organization contacts 1268 adult men who are 40 to 60 years of age and live in the United States and asks whether or not they had seen their family doctor within the past 6 months.
What is the population in the study?
- Adult men who are 40 to 60 years of age.
 - Adult men who are 40 to 60 years of age and have seen their family doctor.
 - Adult men who are 40 to 60 years of age and live in the United States.
 - Adult men who are 40 to 60 years of age and live in the United States and have seen their family doctor.
- What is the sample in the study?
- Adult men who are 40 to 60 years of age.
 - The 1268 adult men who are 40 to 60 years of age and live in the United States.
 - The 1268 adult men who are 40 to 60 years of age and have seen their family doctor.
 - Adult men who are 40 to 60 years of age and live in the United States.
15. Some people responded to this request: ‘Dial 1-900-PRO-LIFE to participate in a telephone poll on abortion. (\$3.95 per minute. Average call: 1 minute. You must be 18 years old.)’ Identify the (a) sample and (b) population. Also, determine whether the sample is likely to be representative of the population.
Identify the sample. Choose the correct answer below.
- The sample is a non-randomly selected group from all individuals who responded.
 - The sample is all individuals who knew about abortion and were at least 18 years of age.
 - The sample is a randomly selected group from all individuals who responded.
 - The sample is all individuals who responded.

Identify the population. Choose the correct answer below.

- a. The population is all individuals regardless of their age.
- b. The population is all individuals with opinions about the abortion issue.
- c. The population is all individuals who are at least 18 years of age.
- d. The population is all individuals who knew about the poll.

Is the sample likely to be representative of the population'?

- a. Yes, the sample is likely to be representative of the population because those who respond are not likely to be biased.
- b. No, the sample is not likely to be representative of the population because those with strong opinions about abortion are more likely to respond.
- c. No, the sample is not likely to be representative of the population because not all individuals within the population are likely to respond.
- d. Yes, the sample is likely to be representative of the population because any individual within the population can respond.

16. Why is a voluntary response sample generally unsuitable for methods of statistics? Choose the correct answer below.
 - a. People with special interests are more likely to respond, so the sample is likely to be biased.
 - b. Samples are likely to be far too small, so conclusions should not be made.
 - c. Samples are likely to be far too large, so conclusions should not be made.
 - d. People likely to respond are targeted by the researchers, so the sample is likely to be biased.
17. A researcher determines that he needs results from at least 500 subjects to conduct a study. In order to compensate for low return rates, he mails a survey to 10,000 subjects and receives 523 responses. Is his sample of 523 responses a good sample? Is his sample of 523 responses a good sample?
 - a. Yes, because it is a voluntary response sample.
 - b. No, because the sample is random.
 - c. No, because the response rate is low and it is a voluntary response sample.
 - d. Yes, because it is representative of the population.
18. Based on a study of heights of men and women who are jockeys, a researcher concludes that riding horses causes people to become shorter. Do you agree with this conclusion? Choose which conclusion you agree with.
 - a. Yes. People who are jockeys eat less and therefore grow less.
 - b. No. There may be a relationship between height and being a jockey, but that does not mean that one causes the other.
 - c. Yes. The exercise from riding horses does cause people to grow less.
 - d. No. There is no relationship between height and being a jockey.
19. Develop an alternative or correct conclusion. For example, consider a media report that expensive sports cars cause people to be healthier. Here is an alternative conclusion: Owners of expensive sports cars tend to be wealthier than others, and greater wealth is associated with better health. A study showed that college graduates tend to live longer than those who do not graduate from college. Conclusion: Studying causes people to live longer. What is a more likely conclusion?
 - a. College graduates tend to be more intelligent, and intelligent people tend to live longer.
 - b. College graduates are likely to have higher incomes and can afford better health care, so they are likely to live longer.
 - c. There is no relationship between studying and living longer.
20. An author wrote a book about the health benefits of exercise. Her conclusions were based on 7,293 replies received after mailing 139,302 questionnaires. Are her conclusions likely to be valid in the sense that they can be applied to the general population? Why or why not?
 - a. Yes, enough responses were received to make valid conclusions.
 - b. No, not enough responses were received to make valid conclusions.
 - c. Yes, the numbers were precise.
 - d. No, it was a voluntary response sample.
21. Several studies showed that after eating a low-fat cereal for two meals a day, subjects had lost some weight. A cereal company financed this research. What is wrong with this study?
 - a. Self-interest study
 - b. Voluntary response sample
 - c. Nonresponse
 - d. Partial picture
 - e. Deliberate distortion
 - f. Precise numbers
22. In a mail-in poll, 190,000 respondents each mailed in a post card with the answers to a question about an economic stimulus package for seniors. The results showed that 68% of those who responded were in favor of an economic stimulus package for seniors. Interpret the results by identifying what we can conclude about the way the general population feels about an economic stimulus package for seniors. What can we conclude?
 - a. The sample suggests that 68% of the general public are in favor of an economic stimulus package for seniors because it is a random sample.
 - b. The sample cannot be used to conclude anything about the general population (general public) because it is a voluntary response sample.
 - c. The sample suggests that more than 68% of the general public are in favor of an economic stimulus package for seniors because it is a random sample.
 - d. The sample suggests that 68% of the general public are in favor of an economic stimulus package for seniors because it is a voluntary

response sample.

23. A statistical abstract includes the average per capita income for each of 30 states. When those 30 values are added, then divided by 30, the result is \$29,367.96. Is \$29,367.96 the average per capita income for all individuals in the 30 states? Why or why not? Choose the correct answer below.
- No, because not all states are taken into account.
 - Yes, because everyone in the population is taken into account.
 - No, because population sizes are not taken into account.
 - Yes, because the calculated value is an average of each state average.
- 24.
- Convert the fraction $\frac{3}{8}$ to an equivalent percentage.
 - Convert 66.2% to an equivalent decimal.
 - What is 83% of 200?
 - Convert 0.846 to an equivalent percentage
25. In a poll, 34% of 382 surveyed adults said that rising gas prices are “quite annoying”.
- What is the actual number of adults who said that rising gas prices are “quite annoying”?
 - Among the 382 surveyed adults, 194 said that rising gas prices are “not at all annoying”. What is the percentage of people who chose “not at all annoying”?
 - What is the actual number of adults who said that rising gas prices are “quite annoying”? (Round to the nearest integer as needed.)
 - What is the percentage of people who chose “not at all annoying”? (Round to the nearest tenth as needed.)
26. An online polling site posed this question: “How much stock do you put in long-range weather forecasts?” Among its Web site users, 38,260 chose to respond. Complete parts (i) through (iii) below.
- Among the responses received, 3% answered with “a lot.” What is the actual number of responses consisting of “a lot”? (Round to the nearest integer as needed)
 - Among the responses received, 18,532 consisted of “very little or none.” What percentage of responses consisted of “very little or none”? (Round to the nearest integer as needed.)
 - Because the sample size of 38,260 is so large, can we conclude that about 3% of the general population puts “a lot” of stock in long-range weather forecasts? Why or why not?
 - No, because the sample is a voluntary response sample, so the sample is not likely to be representative of the population.
 - No, because even though the sample size is so large, there is still a margin of error. Yes, because the sample is so large, the margin of error is negligible.
 - Yes, because the sample size is large enough so that the sample is representative of the population.
27. What is the difference between a random sample and a simple random sample? Choose the correct answer below.
- With a random sample, all samples of the same size have the same chance of being selected.
 - With a simple random sample, each individual has the same chance of being selected.
 - With a random sample, each individual has the same chance of being selected. With a simple random sample, all samples of the same size have the same chance of being selected.
28. Determine whether the description corresponds to an observational study or an experiment. A study is conducted to determine if there is a relation between skin cancer and hair color. Does the description correspond to an observational study or an experiment?
- Observational study
 - Experiment
29. Determine whether the given description corresponds to an observational study or an experiment. In a study of 367 students with a particular disease, the subjects were asked about their diet. Does the given description correspond to an observational study or an experiment?
- The given description corresponds to an observational study.
 - The given description corresponds to an experiment.
 - The given description does not provide enough information to answer this question.
30. Identify which type of sampling is used: random, systematic, convenience, stratified, or cluster. A television station asks its viewers to call in their opinion regarding the desirability of programs in high definition TV. Which type of sampling is used?
- Convenience
 - Systematic
 - Cluster
 - Random
 - Stratified
31. Identify the type of sampling used: random, systematic, convenience, stratified, or cluster. To estimate the percentage of defects in a recent manufacturing batch, a quality control manager at General Foods selects every 12th soup can that comes off the assembly line starting with the seventh until she obtains a sample of 150 soup cans. Which type of sampling is used?
- Cluster
 - Systematic
 - Convenience
 - Stratified

e. Random

32. Identify which type of sampling is used: random, systematic, convenience, stratified, or cluster. To determine her blood sugar level, Samantha divides up her day into three parts: morning, afternoon, and evening. She then measures her blood sugar level at 2 randomly selected times during each part of the day. Which type of sampling is used?
- Systematic
 - Convenience
 - Cluster
 - Stratified
 - Random
33. Identify the type of sampling used (random, systematic, convenience, stratified, or cluster sampling) in the situation described below. A woman experienced a tax audit. The tax department claimed that the woman was audited because she was randomly selected from all women in her tax bracket. Which type of sampling did the tax department use?
- Convenience sampling
 - Cluster sampling
 - Systematic sampling
 - Stratified sampling
 - Random sampling
34. Identify which type of sampling is used: random, systematic, convenience, stratified, or cluster. To determine customer opinion of their pricing, Home Depot randomly selects 130 check out lines during a certain week and surveys all customers in the check out lines. Which type of sampling is used?
- Convenience
 - Cluster
 - Systematic
 - Stratified
 - Random
35. A quality control engineer selects the first 1400 chocolate candies that are produced. Does this sampling plan result in a random sample?
- No, because each item does not have an equal chance of being selected.
 - Yes, because each item has an equal chance of being selected.
 - No, because each group of n items does not have an equal chance of being selected.
 - Yes, because each group of n items has an equal chance of being selected.
- Does this sampling plan result in a simple random sample?
- Yes, because each group of n items has an equal chance of being selected.
 - No, because each item does not have an equal chance of being selected.
 - No, because each group of n items does not have an equal chance of being selected.
 - Yes, because each item has an equal chance of being selected.
36. A packager wraps one item every 20 minutes, so 24 items are completed in her first day of work. Her manager checks her work by randomly selecting an hour of the day, then reviewing all the items she completed that hour. Does this sampling plan result in a random sample?
- No, because each item does not have an equal chance of being selected.
 - No, because all possible groups of n items do not have an equal chance of being selected.
 - Yes, because each item has an equal chance of being selected.
 - Yes, because all possible groups of n items have an equal chance of being selected.
- Does this sampling plan result in a simple random sample?
- No, because all possible groups of n items do not have an equal chance of being selected.
 - Yes, because each item has an equal chance of being selected.
 - No, because each item does not have an equal chance of being selected.
 - Yes, because all possible groups of n items have an equal chance of being selected.