

Name _____ Date _____

1. When TV advertisements report, "2 out of 3 dentists surveyed indicated they would recommend Brand X toothpaste to their patients," an informed consumer may question the conclusion because
 - a. the sample was only 5 dentists
 - b. the sample of dentists is clearly explained
 - c. the advertisement does not include the total number of dentists surveyed
 - d. the conclusion is not illustrated with a graph
2. A marketing class of 50 students evaluated the instructor using the following scale: superior, good, average, poor, and inferior. The descriptive summary showed the following survey results: 2% superior, 8% good, 45% average, 45% poor, and 0% inferior.
 - a. The instructor's performance was great!
 - b. The instructor's performance was inferior.
 - c. Most students rated the instructor as poor or average.
 - d. No conclusions can be made.
3. Which of the following is an example of a continuous variable?
 - a. Family income
 - b. Number of students in a statistics class
 - c. Zip codes of shoppers
 - d. Rankings of baseball teams in a league
4. What type of variable is the number of gallons of gasoline pumped by a filling station during a day?
 - a. Qualitative
 - b. Continuous
 - c. Attribute
 - d. Discrete
5. What level of measurement is the price of an admission ticket to a movie theater?
 - a. Nominal
 - b. Ordinal
 - c. Interval
 - d. Ratio
6. What level of measurement is a bar code?
 - a. Ratio
 - b. Ordinal
 - c. Interval
 - d. Nominal
7. When data is collected using a quantitative, ratio variable, what is true about a frequency distribution that summarizes the data?
 - a. Upper and lower class limits must be calculated.
 - b. A pie chart can be used to summarize the data.
 - c. Number of classes is equal to the number of variable values.
 - d. The "5 to the k rule" can be applied.

8. When data is collected using a qualitative, nominal variable, what is true about a frequency distribution that summarizes the data?
- Upper and lower class limits must be calculated.
 - A pie chart can be used to summarize the data.
 - Number of classes is equal to the number of variable values plus 2.
 - The "5 to the k rule" can be applied.
9. Refer to the following breakdown of responses to a survey of room cleanliness in a hotel:
- | Response | Frequency |
|------------------|-----------|
| Not satisfied | 20 |
| Satisfied | 40 |
| Highly satisfied | 20 |
- What percent of the responses indicated that customers were satisfied?
- 20%
 - 25%
 - 50%
 - 100%
10. What is the relationship among the mean, median, and mode in a symmetric distribution?
- They are all equal.
 - The mean is always the smallest value.
 - The mean is always the largest value.
 - The mode is the largest value.
11. For a data set, half of the observations are always greater than the
- median
 - mode
 - mean
 - standard deviation
12. What statistics are needed to draw a box plot?
- Minimum, maximum, median, and first and third quartiles
 - Median, mean, and standard deviation
 - A median and an interquartile range
 - A mean and a standard deviation
13. A box plot shows
- the mean and variance
 - the relative symmetry of a distribution for a set of data
 - the percentiles of a distribution
 - the deciles of a distribution
14. In a contingency table, we describe the relationship between
- two variables measured at the ordinal or nominal level
 - two variables, one measured as an ordinal variable and the other as a ratio variable
 - two variables measured at the interval or ratio level
 - a variable measure on the interval or ratio level and time

15. A firm offers routine physical examinations as part of a health service program for its employees. The exams showed that 8% of the employees needed corrective shoes, 15% needed major dental work, and 3% needed both corrective shoes and major dental work. What is the probability that an employee selected at random will need either corrective shoes or major dental work?
- 0.20
 - 0.25
 - 0.50
 - 1.00
16. A survey of top executives revealed that 35% of them regularly read *Time* magazine, 20% read *Newsweek* and 40% read *U.S. News & World Report*. Ten percent read both *Time* and *U.S. News & World Report*. What is the probability that a particular top executive reads either *Time* or *U.S. News & World Report* regularly?
- 0.85
 - 0.06
 - 1.00
 - 0.65
17. The upper and lower limits of a uniform probability distribution are
- positive and negative infinity
 - plus and minus three standard deviations
 - 0 and 1
 - the maximum and minimum values of the random variable
18. What is an important similarity between the uniform and normal probability distributions?
- The mean, median, and mode are all equal.
 - The mean and median are equal.
 - They are negatively skewed.
 - About 68% of all observations are within one standard deviation of the mean.
19. What is a normal distribution with a mean of 0 and a standard deviation of 1 called?
- Frequency distribution
 - z-score
 - Standard normal distribution
 - Binomial probability distribution
20. What is the area under the normal curve between $z = 0.0$ and $z = 1.79$?
- 0.4633
 - 0.0367
 - 0.9599
 - 0.0401
21. What is the area under the normal curve between $z = 0.0$ and $z = 2.0$?
- 1.0000
 - 0.7408
 - 0.1359
 - 0.4772

22. A machine is set to fill the small size packages of M&M's® candies with 56 candies per bag. A sample revealed 3 bags of 56, 2 bags of 57, 1 bag of 55, and 2 bags of 58. How many degrees of freedom are there?
- 9
 - 1
 - 8
 - 7
23. What is the critical value for a one-tailed hypothesis test in which a null hypothesis is tested at the 5% level of significance based on a sample size of 25?
- 1.708
 - 1.711
 - 2.060
 - 2.064
24. What is a Type II error?
- Accepting a false null hypothesis
 - Rejecting a false null hypothesis
 - Accepting a false alternate hypothesis
 - Rejecting a false alternate hypothesis
25. When is it appropriate to use the paired difference t -test?
- Four samples are compared at once.
 - Any two samples are compared.
 - Two independent samples are compared.
 - Two dependent samples are compared.
26. Using two independent samples, we test for a hypothesized difference between two population means. The population standard deviations are equal. The number in the first sample is 15 and the number in the second sample is 12. How many degrees of freedom are associated with the critical value?
- 24
 - 25
 - 26
 - 27
27. - What does a coefficient of correlation of 0.70 infer?
- There is almost no correlation because 0.70 is close to 1.0.
 - 70% of the variation in one variable is explained by the other.
 - Coefficient of determination is 0.49.
 - Coefficient of nondetermination is 0.30.

28. What is the range of values for a coefficient of correlation?
- a. 0 to +1.0
 - b. -3 to +3 inclusive
 - c. -1.0 to +1.0 inclusive
 - d. Unlimited range
29. The Pearson product-moment correlation coefficient, r , requires that variables are
- a. measured with an interval scale
 - b. a continuous variable
 - c. measured with an ordinal scale
 - d. a qualitative variable
30. If we are performing a two-tailed test of whether $\mu = 50$, what would be the probability of detecting a shift of the mean to 65 from the mean to 55.
- a. Less than 0.5
 - b. Greater than 0.5
 - c. Equal to 0.5
 - d. Cannot be determined

Understanding Business Research Terms and Concepts

Determine which level of measurement (nominal, ordinal, interval, or ratio) is used in the following examples.

1. The Association of Accountants is conducting a survey to determine the ranking of the top 100 accounting firms in the world.
2. How many years did it take you to earn your college degree?
3. On a questionnaire which asks for gender, males are coded as 1 and females are coded as 2.
4. Respondents are asked to rate a list of high-tech companies as *excellent*, *good*, *fair*, or *poor* in term of their service delivery.
5. Cereal brands are arranged in an ordered sequence in which an equal interval exists between each point.
6. LeBron James wears the number 23 on his jersey.
7. The length of time it takes the winner of a marathon to cross the finish line.
8. Students are asked to rank computer manufacturers.
9. The brand of charge card used by a customer.
10. The pin number used to access your checking account.

Which sampling method—simple random, systematic, stratified, cluster, convenience, judgment, quota, or snowball—is most appropriate for the following examples?

11. The unemployment rate is calculated each month by the U.S. Bureau of Labor Statistics. The survey consists of 50,000 households in about 2,000 counties and cities in all 50 states.
12. A researcher for Kraft Foods selects five states randomly, and then selects 10 supermarkets chains within each state to call for a phone survey as test markets for a new cookie.
13. A new product researcher would like to investigate the use of virtual teams. After conducting an interview with a manager, she asks for the names of other managers that use virtual teams.
14. A news reporter asks people on the street their opinion about the president's new bill.
15. Jamie select Denver, Colorado; Chicago, Illinois; and San Diego, California as test markets for a new potato chip line base on her experience with these markets.
16. A researcher instructs field interviewers to interview customers of different cell phone companies in a nearby shopping mall so that they each interview 10 AT&T, 8 T Mobile, 6 Verizon, and 4 owners of other cell phone providers.
17. The Consumer Price Index represents a sampling of 90,000 items from 364 categories, chosen from 20,000 retail stores in 85 geographically distributed areas that are chosen to be as similar as possible.
18. A finance professor wants to know how many MBA students would be willing to take a course in international finance this summer. She surveys students in the class she is currently teaching.

Which hypothesis-testing procedure would you use in the following situations?

- 19 The mean time an American family lives in a particular single-family dwelling is 11.8 years. A sample of 100 families in the Sycamore, OK area shows the mean time living in a single family residence is 12.7 years. Can we conclude that the time people live in Sycamore is significantly more than the national average?
- 20 A researcher would like to know if there is a significant difference in clothing purchases between full-time working women, part-time working women, and women who are homemakers.
- 21 Eighty percent of those who play the state lottery never win more than \$100 in one play. A sample of 500 players was drawn and the mean winning was \$125.
- 22 A drug manufacturing company conducted a survey of customers. The research question was as follows: Is there a significant relationship between packaging preference (size of the bottle purchased) and economic status? There were four packaging sizes: small, medium, large, and jumbo. Economic status was categorized as follows: lower, middle, and upper.
- 23 A company has 24 salespeople. The test must evaluate whether their product knowledge has improved or remained unchanged after a training program.
- 24 A computer company has a brand loyalty rating of 6.8 on a 7 point scale. Is this company's rating significantly different from the industry average of 6.4?
- 25 The manager of an office supply store wanted to determine which color folders she should discontinue based on low sales. The colors stocked were black, blue, red, green, and purple.