Chapter 1 - The Nature of Probability and Statistics

1. Statistics is the science of conducting studies to
   A)   solve a system of equations.
   B)   hypothesize, experiment, and form conclusions.
   C)   collect, organize, summarize, analyze, and draw conclusions from data.
   D)   monitor, study, and report on a subject.
   Ans: C   Difficulty: Easy   Section: 1.1

2. How are statistics important in our everyday lives, and why do we need to understand them?
   Ans: Statistics are used to analyze the results of surveys. It is important to understand the terms and concepts so that one can understand exactly what is being represented (or misrepresented) by a given statement.
   Difficulty: Moderate   Section: 1.1

3. A _____ is a characteristic or attribute of a subject that can assume different values?
   A) datum   B) variable   C) exponent   D) sample
   Ans: B   Difficulty: Easy   Section: 1.1

4. Variables with values that are determined by chance are called _____.
   A)   specialized.   C)   random variables.
   B)   erratic variables.   D)   inconsistent variables.
   Ans: C   Difficulty: Easy   Section: 1.1

5. Each value in a data set may be referred to as either a data value or a(n) _____.
   A) subdata   B) datum   C) atom   D) point
   Ans: B   Difficulty: Moderate   Section: 1.1

6. If a weather center monitors and calculates the average number of tornadoes that pass through Topeka, Kansas each year, what type of variable would they be investigating?
   A)   random variable   C)   isolated variable
   B)   controlled variable   D)   hypothesis variable
   Ans: A   Difficulty: Moderate   Section: 1.1

7. Inferential statistics is based on probability.
   Ans: True   Difficulty: Easy   Section: 1.1

8. Which of the following correctly describes the relationship between a sample and a population?
    A)   A sample is a group of populations that are subject to observation.
    B)   A population is a group of samples that may or may not be included in a study.
    C)   A sample is a group of subjects selected from a population to be studied.
    D)   A population and a sample are not related.
    Ans: C   Difficulty: Moderate   Section: 1.1

9. A _____ consists of all subjects that are being studied.
    Ans: population
    Difficulty: Moderate   Section: 1.1

10. _____ is a decision-making process for evaluating claims about a population, based on information obtained from samples.
    Ans: Hypothesis testing
    Difficulty: Moderate   Section: 1.1

11. Which branch of statistics would employ probability to predict how many miles one should be able to drive a 2000 Toyota Celica during its lifetime?
    A)   time series statistics   C)   inferential statistics
    B)   descriptive statistics   D)   differential statistics
    Ans: C   Difficulty: Moderate   Section: 1.1

12. In which branch of statistics would a researcher acquire twenty-five 2000 Toyota Celicas, drive them until they had a major mechanical failure, record the final mileage, and then write a report for *Car and Driver*?
    A)   predictive statistics   C)   inferential statistics
    B)   descriptive statistics   D)   differential statistics
    Ans: B   Difficulty: Moderate   Section: 1.1

13. Based on her electric bills from last year, Mrs. Smith expects she will be paying $75/month this year. This is an example of descriptive statistics.
    Ans: False   Difficulty: Moderate   Section: 1.1

14. What level of measurement would be applied when doing a survey on the average American's shoe size?
    Ans: the interval level of measurement
    Difficulty: Moderate   Section: 1.2

15. What level of measurement classifies data into mutually exclusive categories in which no order or ranking can be imposed on the data?
    A) nominal   B) ordinal   C) interval   D) ratio
    Ans: A   Difficulty: Moderate   Section: 1.2

16. What level of measurement allows for the ranking of data, a precise difference between units of measure, and also includes a true zero?
    A) nominal   B) ordinal   C) interval   D) ratio
    Ans: D   Difficulty: Moderate   Section: 1.2

17. Classifying the fruit in a basket as apple, orange, or banana, is an example of the _____ level of measurement?
    A) nominal   B) ordinal   C) interval   D) ratio
    Ans: A   Difficulty: Moderate   Section: 1.2

18. Rating a restaurant by a number of stars is an example of an ordinal level of measurement.
    Ans: True   Difficulty: Moderate   Section: 1.2

19. The _____ level of measurement classifies data into categories that can be ranked; however, precise differences between the ranks do not exist.
    Ans: ordinal
    Difficulty: Moderate   Section: 1.2

20. Determining the number of people from the state of Alaska who voted for a Republican in the last election is an example of _____ measurement.
    Ans: ratio-level
    Difficulty: Moderate   Section: 1.2

21. A person's hair color would be an example of a quantitative variable.
    Ans: False   Difficulty: Moderate   Section: 1.2

22. The variable of height is an example of a quantitative variable.
    Ans: True   Difficulty: Moderate   Section: 1.2

23. Explain the difference between qualitative, quantitative, discrete, and continuous variables.
    Ans: Qualitative variables can be placed into distinct categories, but they cannot be ranked. Quantitative variables are discrete if they can be assigned a value, generally an integer, and they can be counted. Quantitative variables are continuous if they can assume an infinite number of values between two specific values.
    Difficulty: Moderate   Section: 1.2

24. A _____ variable assumes values that can be counted.
    Ans: discrete
    Difficulty: Moderate   Section: 1.2

25. The number of birds in a tree is an example of a continuous variable.
    Ans: False   Difficulty: Easy   Section: 1.2

26. Quantitative data can be further classified as continuous or nonsequential.
    Ans: False   Difficulty: Easy   Section: 1.2

27. The amount of time needed to run the Boston marathon is an example of which type of variable?
    A) discrete   B) qualitative   C) continuous   D) temporal
    Ans: C   Difficulty: Easy   Section: 1.2

28. The four basic methods used to obtain samples are: random, irregular, cluster, and stratified sampling.
    Ans: False   Difficulty: Easy   Section: 1.3

29. In a research study, it is always preferable for the researcher to carefully choose his participants rather than randomly select them from a suitable group..
    Ans: False   Difficulty: Moderate   Section: 1.3

30. _____ sampling is used when the population is large and it includes subjects residing over a large geographic area.
    Ans: Cluster
    Difficulty: Moderate   Section: 1.3

31. How might a telephone survey performed between the hours of 8 AM and 5 PM be biased?
    Ans: The telephone survey may be biased as they can only interview people who are available during standard working hours.
    Difficulty: Moderate   Section: 1.3

32. If you were told that four students from a class of twenty were questioned for a poll about study habits, this would be an example of _____.
    A)   random sampling   C)   stratified sampling
    B)   systematic sampling   D)   cluster sampling
    Ans: D   Difficulty: Moderate   Section: 1.3

33. What type of sampling is being employed if the country is divided into economic classes and a sample is chosen from each class to be surveyed?
    A)   random sampling   C)   stratified sampling
    B)   systematic sampling   D)   cluster sampling
    Ans: C   Difficulty: Moderate   Section: 1.3

34. Questioning every 14th customer leaving a theatre about the movie they had seen, would be an example of systematic sampling.
    Ans: True   Difficulty: Moderate   Section: 1.3