Descriptive statistics

MULTIPLE CHOICE

1. A frequency distribution is a tabular summary of data showing the
   a. fraction of items in several classes
   b. percentage of items in several classes
   c. relative percentage of items in several classes
   d. number of items in several classes

   ANS: PTS: 1 TOP: Descriptive Statistics

2. A tabular summary of a set of data showing the fraction of the total number of items in several classes is a
   a. frequency distribution
   b. relative frequency distribution
   c. frequency
   d. cumulative frequency distribution

   ANS: PTS: 1 TOP: Descriptive Statistics

3. The percent frequency of a class is computed by
   a. multiplying the relative frequency by 10
   b. dividing the relative frequency by 100
   c. multiplying the relative frequency by 100
   d. adding 100 to the relative frequency

   ANS: PTS: 1 TOP: Descriptive Statistics

4. Fifteen percent of the students in a school of Business Administration are majoring in Economics, 20% in Finance, 35% in Management, and 30% in Accounting. The graphical device(s) which can be used to present these data is (are)
   a. a line chart
   b. only a bar chart
   c. only a pie chart
   d. both a bar chart and a pie chart

   ANS: PTS: 1 TOP: Descriptive Statistics

5. Categorical data can be graphically represented by using a(n)
   a. histogram
   b. frequency polygon
   c. ogive
   d. bar chart

   ANS: PTS: 1 TOP: Descriptive Statistics

6. A cumulative relative frequency distribution shows
   a. the proportion of data items with values less than or equal to the upper limit of each class
   b. the proportion of data items with values less than or equal to the lower limit of each class
   c. the percentage of data items with values less than or equal to the upper limit of each class
   d. the percentage of data items with values less than or equal to the lower limit of each class

   ANS: PTS: 1 TOP: Descriptive Statistics

7. The sum of the relative frequencies for all classes will always equal
   a. the sample size
   b. the number of classes
   c. one
   d. any value larger than one

   ANS: PTS: 1 TOP: Descriptive Statistics

8. The most common graphical presentation of quantitative data is a
   a. histogram
   b. bar chart
   c. relative frequency
   d. pie chart

   ANS: PTS: 1 TOP: Descriptive Statistics

9. The relative frequency of a class is computed by
   a. dividing the cumulative frequency of the class by n
   b. dividing n by cumulative frequency of the class
   c. dividing the frequency of the class by n
   d. dividing the frequency of the class by the number of classes

   ANS: PTS: 1 TOP: Descriptive Statistics

10. In constructing a frequency distribution, as the number of classes are decreased, the class width
    a. decreases
    b. remains unchanged
    c. increases
    d. can increase or decrease depending on the data values

    ANS: PTS: 1 TOP: Descriptive Statistics

11. In a cumulative frequency distribution, the last class will always have a cumulative frequency equal to
    a. one
    b. 100%
    c. the total number of elements in the data set
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Descriptive Statistics

Introduction to probability

MULTIPLE CHOICE

1. Each individual outcome of an experiment is called
   a. the sample space
   b. a sample point
   c. an experiment
   d. an individual

   ANS: PTS: 1 TOP: Probability Concepts

2. A graphical method of representing the sample points of an experiment is
   a. a frequency polygon
   b. a histogram
   c. an ogive
   d. a tree diagram

   ANS: PTS: 1 TOP: Probability Concepts

3. Any process that generates well-defined outcomes is
   a. an event
   b. an experiment
   c. a sample point
   d. a sample space

   ANS: PTS: 1 TOP: Probability Concepts

4. In statistical experiments, each time the experiment is repeated
   a. the same outcome must occur
   b. the same outcome can not occur again
   c. a different outcome may occur
   d. a different out come must occur

   ANS: PTS: 1 TOP: Probability Concepts

5. The counting rule that is used for counting the number of experimental outcomes when n objects are selected from a set of N objects where *order of selection* **is not** important is called
   a. permutation
   b. combination
   c. multiple step experiment
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Probability Concepts

6. From a group of six people, two individuals are to be selected at random. How many possible selections are there?
   a. 12
   b. 36
   c. 15
   d. 8

   ANS: PTS: 1 TOP: Probability Concepts

7. A method of assigning probabilities based upon judgment is referred to as the
   a. relative method
   b. probability method
   c. classical method
   d. subjective method

   ANS: PTS: 1 TOP: Probability Concepts

8. A graphical device used for enumerating sample points in a multiple-step experiment is a
   a. bar chart
   b. pie chart
   c. histogram
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Probability Concepts

9. The set of all possible outcomes of an experiment is
   a. an experiment
   b. an event
   c. the population
   d. the sample space

   ANS: PTS: 1 TOP: Probability Concepts

10. If a dime is tossed four times and comes up tails all four times, the probability of heads on the fifth trial is
    a. smaller than the probability of tails
    b. larger than the probability of tails
    c. 1/2
    d. 1/32

    ANS: PTS: 1 TOP: Probability Concepts

11. Of five letters (A, B, C, D, and E), two letters are to be selected at random. How many possible selections are there?
    a. 20
    b. 7
    c. 5!
    d. 10

    ANS: PTS: 1 TOP: Probability Concepts

12. Assume your favorite football team has 2 games left to finish the season. The outcome of each game can be win, lose or tie. The number of possible outcomes is
    a. 2
    b. 4
    c. 6
    d. 9

    ANS: PTS: 1 TOP: Probability Concepts

13. An experiment consists of tossing 4 coins successively. The number of sample points in this experiment is
    a. 16
    b. 8
    c. 4
    d. 2

    ANS: PTS: 1 TOP: Probability Concepts

14. Since the sun **must** rise tomorrow, then the probability of the sun rising tomorrow is
    a. much larger than one
    b. zero
    c. infinity
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Probability Concepts

15. If a coin is tossed three times, the likelihood of obtaining three heads in a row is
    a. zero
    b. 0.500
    c. 0.875
    d. 0.125

    ANS: PTS: 1 TOP: Probability Concepts

16. Of the last 100 customers entering a computer shop, 25 have purchased a computer. If the classical method for computing probability is used, the probability that the next customer will purchase a computer is
    a. 0.25
    b. 0.50
    c. 1.00
    d. 0.75

    ANS: PTS: 1 TOP: Probability Concepts

17. A six-sided die is tossed 3 times. The probability of observing three ones in a row is
    a. 1/3
    b. 1/6
    c. 1/27
    d. 1/216

    ANS: PTS: 1 TOP: Probability Concepts

18. A perfectly balanced coin is tossed 6 times and tails appears on all six tosses. Then, on the seventh trial
    a. tails can not appear
    b. heads has a larger chance of appearing than tails
    c. tails has a better chance of appearing than heads
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Probability Concepts

Discrete probability distributions

MULTIPLE CHOICE

1. A numerical description of the outcome of an experiment is called a
   a. descriptive statistic
   b. probability function
   c. variance
   d. random variable

   ANS: PTS: 1 TOP: Discrete Probability Distributions

2. A continuous random variable may assume
   a. any value in an interval or collection of intervals
   b. only integer values in an interval or collection of intervals
   c. only fractional values in an interval or collection of intervals
   d. only the positive integer values in an interval

   ANS: PTS: 1 TOP: Discrete Probability Distributions

3. An experiment consists of determining the speed of automobiles on a highway by the use of radar equipment. The random variable in this experiment is a
   a. discrete random variable
   b. continuous random variable
   c. complex random variable
   d. simplex random variable

   ANS: PTS: 1 TOP: Discrete Probability Distributions

4. The weight of an object is an example of
   a. a continuous random variable
   b. a discrete random variable
   c. either a continuous or a discrete random variable, depending on the weight of the object
   d. either a continuous or a discrete random variable depending on the units of measurement

   ANS: PTS: 1 TOP: Discrete Probability Distributions

5. A description of the distribution of the values of a random variable and their associated probabilities is called a
   a. probability distribution
   b. random variance
   c. random variable
   d. expected value

   ANS: PTS: 1 TOP: Discrete Probability Distributions

6. Which of the following is **not** a required condition for a discrete probability function?
   a. $f(x) \geq 0$ for all values of x
   b. $\sum f(x) = 1$ for all values of x
   c. $\sum f(x) = 0$ for all values of x
   d. $\sum f(x) \geq 1$ for all values of x

   ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-12
The police records of a metropolitan area kept over the past 300 days show the following number of fatal accidents.

Number of Fatal Accidents	Number of Days
0	45
1	75
2	120
3	45
4	15

7. Refer to Exhibit 5-12. What is the probability that in a given day there will be less than 3 accidents?
   a. 0.2
   b. 120
   c. 0.5
   d. 0.8

   ANS: PTS: 1 TOP: Discrete Probability Distributions

8. Refer to Exhibit 5-12. What is the probability that in a given day there will be no accidents?
   a. 0.00
   b. 1.00
   c. 0.85
   d. 0.15

   ANS: PTS: 1 TOP: Discrete Probability Distributions

9. Variance is
   a. a measure of the average, or central value of a random variable
   b. a measure of the dispersion of a random variable
   c. the square root of the standard deviation
   d. the sum of the squared deviation of data elements from the mean

   ANS: PTS: 1 TOP: Discrete Probability Distributions

10. The standard deviation is the
    a. variance squared
    b. square root of the sum of the deviations from the mean
    c. same as the expected value
    d. positive square root of the variance

    ANS: PTS: 1 TOP: Discrete Probability Distributions

11. A weighted average of the value of a random variable, where the probability function provides weights is known as
    a. a probability function
    b. a random variable
    c. the expected value
    d. random function

    ANS: PTS: 1 TOP: Discrete Probability Distributions

12. The expected value of a discrete random variable
    a. is the most likely or highest probability value for the random variable
    b. will always be one of the values x can take on, although it may not be the highest probability value for the random variable
    c. is the average value for the random variable over many repeats of the experiment
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Discrete Probability Distributions

13. X is a random variable with the probability function:

    $f(X) = X/6$ for X = 1, 2 or 3

    The expected value of X is
    a. 0.333
    b. 0.500
    c. 2.000
    d. 2.333

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-1
The following represents the probability distribution for the daily demand of computers at a local store.

Demand	Probability
0	0.1
1	0.2
2	0.3
3	0.2
4	0.2

14. Refer to Exhibit 5-1. The probability of having a demand for at least two computers is
    a. 0.7
    b. 0.3
    c. 0.4
    d. 1.0

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-3
Roth is a computer-consulting firm. The number of new clients that they have obtained each month has ranged from 0 to 6. The number of new clients has the probability distribution that is shown below.

Number of New Clients	Probability
0	0.05
1	0.10
2	0.15
3	0.35
4	0.20
5	0.10
6	0.05

15. Refer to Exhibit 5-3. The variance is
    a. 1.431
    b. 2.047
    c. 3.05
    d. 21

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-5
Probability Distribution

x	f(x)
10	.2
20	.3
30	.4
40	.1

16. Refer to Exhibit 5-5. The expected value of x equals
    a. 24
    b. 25
    c. 30
    d. 100

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-6
A sample of 2,500 people was asked how many cups of coffee they drink in the morning. You are given the following sample information.

Cups of Coffee	Frequency
0	700
1	900
2	600
3	300
	2,500

17. Refer to Exhibit 5-6. The expected number of cups of coffee is
    a. 1
    b. 1.2
    c. 1.5
    d. 1.7

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-9
The probability distribution for the daily sales at Michael's Co. is given below.

Daily Sales (In $1,000s)	Probability
40	0.1
50	0.4
60	0.3
70	0.2

18. Refer to Exhibit 5-9. The expected daily sales are
    a. $55,000
    b. $56,000
    c. $50,000
    d. $70,000

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-10
The probability distribution for the number of goals the Lions soccer team makes per game is given below.

Number Of Goals	Probability
0	0.05
1	0.15
2	0.35
3	0.30
4	0.15

19. Refer to Exhibit 5-10. The expected number of goals per game is
    a. 0
    b. 1
    c. 2, since it has the highest probability
    d. 2.35

    ANS: PTS: 1 TOP: Discrete Probability Distributions

20. Refer to Exhibit 5-10. What is the probability that in a given game the Lions will score less than 3 goals?
    a. 0.85
    b. 0.55
    c. 0.45
    d. 0.80

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-11
A local bottling company has determined the number of machine breakdowns per month and their respective probabilities as shown below:

Number of Breakdowns	Probability
0	0.12
1	0.38
2	0.25
3	0.18
4	0.07

21. Refer to Exhibit 5-11. The expected number of machine breakdowns per month is
    a. 2
    b. 1.70
    c. one, since it has the highest probability
    d. at least 4

    ANS: PTS: 1 TOP: Discrete Probability Distributions

22. Refer to Exhibit 5-11. The probability of no breakdowns in a month is
    a. 0.88
    b. 0.00
    c. 0.50
    d. 0.12

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-13

Oriental Reproductions, Inc. is a company that produces handmade carpets with oriental designs. The production records show that the monthly production has ranged from 1 to 5 carpets. The production levels and their respective probabilities are shown below.

Production Per Month x	**Probability f(x)**
1	0.01
2	0.04
3	0.10
4	0.80
5	0.05

23. Refer to Exhibit 5-13. The standard deviation for the production is
    a. 4.32
    b. 3.74
    c. 0.374
    d. 0.612

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

24. A probability distribution showing the probability of x successes in n trials, where the probability of success does not change from trial to trial, is termed a
    a. uniform probability distribution
    b. binomial probability distribution
    c. hypergeometric probability distribution
    d. normal probability distribution

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

25. Twenty percent of the students in a class of 100 are planning to go to graduate school. The standard deviation of this binomial distribution is
    a. 20
    b. 16
    c. 4
    d. 2

    ANS: ____ PTS: 1 TOP: Discrete Probability Distributions

26. The binomial probability distribution is used with
    a. a continuous random variable
    b. a discrete random variable
    c. any distribution, as long as it is not normal
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Discrete Probability Distributions

27. Which of the following is a characteristic of a binomial experiment?
    a. at least 2 outcomes are possible
    b. the probability changes from trial to trial
    c. the trials are independent
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Discrete Probability Distributions

28. Assume that you have a binomial experiment with p = 0.5 and a sample size of 100. The expected value of this distribution is
    a. 0.50
    b. 0.30
    c. 100
    d. 50

    ANS: PTS: 1 TOP: Discrete Probability Distributions

29. The standard deviation of a binomial distribution is
    a. $\sigma(x) = P(1 - P)$
    b. $\sigma(x) = nP$
    c. $\sigma(x) = nP(1 - P)$
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Discrete Probability Distributions

30. The variance for the binomial probability distribution is
    a. $var(x) = P(1 - P)$
    b. $var(x) = nP$
    c. $var(x) = n(1 - P)$
    d. $var(x) = nP(1 - P)$

    ANS: PTS: 1 TOP: Discrete Probability Distributions

31. Assume that you have a binomial experiment with p = 0.4 and a sample size of 50. The variance of this distribution is
    a. 20
    b. 12
    c. 3.46
    d. 144

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-2
The student body of a large university consists of 60% female students. A random sample of 8 students is selected.

32. Refer to Exhibit 5-2. What is the probability that among the students in the sample exactly two are female?
    a. 0.0896
    b. 0.2936
    c. 0.0413
    d. 0.0007

    ANS: PTS: 1 TOP: Discrete Probability Distributions

33. Refer to Exhibit 5-2. What is the probability that among the students in the sample at least 6 are male?
    a. 0.0413
    b. 0.0079
    c. 0.0007
    d. 0.0499

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-4
Forty percent of all registered voters in a national election are female. A random sample of 5 voters is selected.

34. Refer to Exhibit 5-4. The probability that there are no females in the sample is
    a. 0.0778
    b. 0.7780
    c. 0.5000
    d. 0.3456

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Exhibit 5-7
The probability that Pete will catch fish when he goes fishing is .8. Pete is going to fish 3 days next week. Define the random variable X to be the number of days Pete catches fish.

35. Refer to Exhibit 5-7. The probability that Pete will catch fish on one day or less is
    a. .008
    b. .096
    c. .104
    d. .8

    ANS: PTS: 1 TOP: Discrete Probability Distributions

36. Refer to Exhibit 5-7. The variance of the number of days Pete will catch fish is
    a. .16
    b. .48
    c. .8
    d. 2.4

    ANS: PTS: 1 TOP: Discrete Probability Distributions

Continuous Distributions

MULTIPLE CHOICE

1. The center of a normal curve is
   a. always equal to zero
   b. is the mean of the distribution
   c. cannot be negative
   d. is the standard deviation

   ANS: PTS: 1 TOP: Continuous Probability Distributions

2. A normal distribution with a mean of 0 and a standard deviation of 1 is called
   a. a probability density function
   b. an ordinary normal curve
   c. a standard normal distribution
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Continuous Probability Distributions

3. In a standard normal distribution, the probability that Z is greater than zero is
   a. 0.5
   b. equal to 1
   c. at least 0.5
   d. 1.96

   ANS: PTS: 1 TOP: Continuous Probability Distributions

4. For any continuous random variable, the probability that the random variable takes on exactly a specific value is
   a. 1.00
   b. 0.50
   c. any value between 0 to 1
   d. almost zero

   ANS: PTS: 1 TOP: Continuous Probability Distributions

5. Which of the following is **not** a characteristic of the normal probability distribution?
   a. The mean, median, and the mode are equal
   b. The mean of the distribution can be negative, zero, or positive
   c. The distribution is symmetrical
   d. The standard deviation must be 1

   ANS: PTS: 1 TOP: Continuous Probability Distributions

6. Larger values of the standard deviation result in a normal curve that is
   a. shifted to the right
   b. shifted to the left
   c. narrower and more peaked
   d. wider and flatter

   ANS: PTS: 1 TOP: Continuous Probability Distributions

7. For a normal distribution, a negative value of z indicates
   a. a mistake has been made in computations, because z is always positive
   b. the area corresponding to the z is negative
   c. the z is to the left of the mean
   d. the z is to the right of the mean

   ANS: PTS: 1 TOP: Continuous Probability Distributions

8. The standard deviation of a standard normal distribution
   a. is always equal to zero
   b. is always equal to one
   c. can be any positive value
   d. can be any value

   ANS: PTS: 1 TOP: Continuous Probability Distributions

9. If the mean of a normal distribution is negative,
   a. the standard deviation must also be negative
   b. the variance must also be negative
   c. a mistake has been made in the computations, because the mean of a normal distribution cannot be negative
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Continuous Probability Distributions

10. The highest point of a normal curve occurs at
    a. one standard deviation to the right of the mean
    b. two standard deviations to the right of the mean
    c. approximately three standard deviations to the right of the mean
    d. the mean

    ANS: PTS: 1 TOP: Continuous Probability Distributions

11. A standard normal distribution is a normal distribution
    a. with a mean of 1 and a standard deviation of 0
    b. with a mean of 0 and a standard deviation of 1
    c. with any mean and a standard deviation of 1
    d. with any mean and any standard deviation

    ANS: PTS: 1 TOP: Continuous Probability Distributions

12. Z is a standard normal random variable. The P $(-1.20 \leq Z \leq 1.50)$ equals
    a. 0.0483
    b. 0.3849
    c. 0.4332
    d. 0.8181

    ANS: PTS: 1 TOP: Continuous Probability Distributions

Sampling and sampling distributions

MULTIPLE CHOICE

1. Parameters are
   a. numerical characteristics of a sample
   b. numerical characteristics of a population
   c. the averages taken from a sample
   d. numerical characteristics of either a sample or a population

   ANS: PTS: 1 TOP: Sampling

2. The purpose of statistical inference is to provide information about the
   a. sample based upon information contained in the population
   b. population based upon information contained in the sample
   c. population based upon information contained in the population
   d. mean of the sample based upon the mean of the population

   ANS: PTS: 1 TOP: Inference

3. From a group of 12 students, we want to select a random sample of 4 students to serve on a university committee. How many different random samples of 4 students can be selected?
   a. 48
   b. 20,736
   c. 16
   d. 495

   ANS: PTS: 1 TOP: Sampling

4. A population consists of 500 elements. We want to draw a simple random sample of 50 elements from this population. On the first selection, the probability of an element being selected is
   a. 0.100
   b. 0.010
   c. 0.001
   d. 0.002

   ANS: PTS: 1 TOP: Sampling

5. A population consists of 8 items. The number of different simple random samples of size 3 that can be selected from this population is
   a. 24
   b. 56
   c. 512
   d. 128

   ANS: PTS: 1 TOP: Combination

6. The number of random samples (without replacement) of size 3 that can be drawn from a population of size 5 is
   a. 15
   b. 10
   c. 20
   d. 125

   ANS: PTS: 1 TOP: Sampling

7. There are 6 children in a family. The number of children defines a population. The number of simple random samples of size 2 (without replacement) which are possible equals
   a. 12
   b. 15
   c. 3
   d. 16

   ANS: PTS: 1 TOP: Sampling

8. The number of different simple random samples of size 5 that can be selected from a population of size 8 is
   a. 40
   b. 336
   c. 13
   d. 56

   ANS: PTS: 1 TOP: Sampling

9. How many different samples of size 3 can be taken from a finite population of size 10?
   a. 30
   b. 1,000
   c. 720
   d. 120

   ANS: PTS: 1 TOP: Sampling

10. In point estimation
    a. data from the population is used to estimate the population parameter
    b. data from the sample is used to estimate the population parameter
    c. data from the sample is used to estimate the sample statistic
    d. the mean of the population equals the mean of the sample

    ANS: PTS: 1 TOP: Sampling

11. The sample mean is the point estimator of
    a. μ
    b. $\bar{\sigma}$
    c. $\bar{x}$
    d. $\bar{p}$

    ANS: PTS: 1 TOP: Inference

12. The standard deviation of a point estimator is called the
    a. standard deviation
    b. standard error
    c. point estimator
    d. variance of estimation

    ANS: PTS: 1 TOP: Sampling

13. The sample statistic, such as $\bar{x}$, s, or $\bar{p}$, that provides the point estimate of the population parameter is known as
    a. a point estimator
    b. a parameter
    c. a population parameter
    d. a population statistic

    ANS: PTS: 1 TOP: Inference

14. A simple random sample of 5 observations from a population containing 400 elements was taken, and the following values were obtained.

    12 18 19 20 21

    A point estimate of the mean is
    a. 400
    b. 18
    c. 20
    d. 10

    ANS: PTS: 1 TOP: Inference

15. The following data was collected from a simple random sample of a population.

    13 15 14 16 12

    The point estimate of the population standard deviation is
    a. 2.500
    b. 1.581
    c. 2.000
    d. 1.414

    ANS: PTS: 1 TOP: Inference

16. The following information was collected from a simple random sample of a population.

    16 19 18 17 20 18

    The point estimate of the population standard deviation is
    a. 2.000
    b. 1.291
    c. 1.414
    d. 1.667

    ANS: PTS: 1 TOP: Inference

Interval estimation

MULTIPLE CHOICE

1. The absolute value of the difference between the point estimate and the population parameter it estimates is
   a. the standard error
   b. the sampling error
   c. precision
   d. the error of confidence

   ANS: PTS: 1 TOP: Interval Estimation

2. A population has a standard deviation of 50. A random sample of 100 items from this population is selected. The sample mean is determined to be 600. At 95% confidence, the margin of error is
   a. 5
   b. 9.8
   c. 650
   d. 609.8

   ANS: PTS: 1 TOP: Interval Estimation

3. For the interval estimation of μ when σ is known and the sample is large, the proper distribution to use is
   a. the normal distribution
   b. the t distribution with n degrees of freedom
   c. the t distribution with n + 1 degrees of freedom
   d. the t distribution with n + 2 degrees of freedom

   ANS: PTS: 1 TOP: Interval Estimation

4. The value added and subtracted from a point estimate in order to develop an interval estimate of the population parameter is known as the
   a. confidence level
   b. margin of error
   c. parameter estimate
   d. interval estimate

   ANS: PTS: 1 TOP: Interval Estimation

5. In order to use the normal distribution for interval estimation of μ when σ is known and the sample is very small, the population
   a. must be very large
   b. must have a normal distribution
   c. can have any distribution
   d. must have a mean of at least 1

   ANS: PTS: 1 TOP: Interval Estimation

6. The z value for a 97.8% confidence interval estimation is
   a. 2.02
   b. 1.96
   c. 2.00
   d. 2.29

   ANS: PTS: 1 TOP: Interval Estimation

7. After computing a confidence interval, the user believes the results are meaningless because the width of the interval is too large. Which one of the following is the best recommendation?
   a. Increase the level of confidence for the interval.
   b. Decrease the sample size.
   c. Increase the sample size.
   d. Reduce the population variance.

   ANS: PTS: 1 TOP: Interval Estimation

8. In general, higher confidence levels provide
   a. wider confidence intervals
   b. narrower confidence intervals
   c. a smaller standard error
   d. unbiased estimates

   ANS: PTS: 1 TOP: Interval Estimation

9. A sample of 225 elements from a population with a standard deviation of 75 is selected. The sample mean is 180. The 95% confidence interval for μ is
   a. 105.0 to 225.0
   b. 175.0 to 185.0
   c. 100.0 to 200.0
   d. 170.2 to 189.8

   ANS: PTS: 1 TOP: Interval Estimation

10. A random sample of 144 observations has a mean of 20, a median of 21, and a mode of 22. The population standard deviation is known to equal 4.8. The 95.44% confidence interval for the population mean is
    a. 15.2 to 24.8
    b. 19.200 to 20.800
    c. 19.216 to 20.784
    d. 21.2 to 22.8

    ANS: PTS: 1 TOP: Interval Estimation

Exhibit 8-1
In order to estimate the average time spent on the computer terminals per student at a local university, data were collected for a sample of 81 business students over a one-week period. Assume the population standard deviation is 1.8 hours.

11. Refer to Exhibit 8-1. The standard error of the mean is
    a. 7.50
    b. 0.39
    c. 2.00
    d. 0.20

    ANS: PTS: 1 TOP: Interval Estimation

12. Refer to Exhibit 8-1. If the sample mean is 9 hours, then the 95% confidence interval is
    a. 7.04 to 110.96 hours
    b. 7.36 to 10.64 hours
    c. 7.80 to 10.20 hours
    d. 8.61 to 9.39 hours

    ANS: PTS: 1 TOP: Interval Estimation

Exhibit 8-2
A random sample of 121 automobiles traveling on an interstate showed an average speed of 65 mph. From past information, it is known that the standard deviation of the population is 22 mph.

13. Refer to Exhibit 8-2. The standard error of the mean is
    a. 22.00
    b. 96.60
    c. 4.24
    d. 2.00

    ANS: PTS: 1 TOP: Interval Estimation

14. Refer to Exhibit 8-2. The 96.6% confidence interval for μ is
    a. 63.00 to 67.00
    b. 60.76 to 69.24
    c. 61.08 to 68.92
    d. 60.00 to 80.00

    ANS: PTS: 1 TOP: Interval Estimation

Exhibit 8-3
The manager of a grocery store has taken a random sample of 100 customers. The average length of time it took these 100 customers to check out was 3.0 minutes. It is known that the standard deviation of the population of checkout times is one minute.

15. Refer to Exhibit 8-3. The standard error of the mean equals
    a. 0.001
    b. 0.010
    c. 0.100
    d. 1.000

    ANS: PTS: 1 TOP: Interval Estimation

Hypothesis tests

MULTIPLE CHOICE

1. An assumption made about the value of a population parameter is called a
   a. hypothesis
   b. conclusion
   c. confidence
   d. significance

   ANS: PTS: 1 TOP: Hypothesis Tests

2. In hypothesis testing if the null hypothesis is rejected,
   a. no conclusions can be drawn from the test
   b. the alternative hypothesis is true
   c. the data must have been accumulated incorrectly
   d. the sample size has been too small

   ANS: PTS: 1 TOP: Hypothesis Tests

3. The average monthly rent for one-bedroom apartments in Chattanooga has been $700. Because of the downturn in the real estate market, it is believed that there has been a decrease in the average rental. The correct hypotheses to be tested are
   a. H_0: $\mu \geq 700$ H_a: $\mu < 700$
   b. H_0: $\mu = 700$ H_a: $\mu \neq 700$
   c. H_0: $\mu > 700$ H_a: $\mu \leq 700$
   d. H_0: $\mu < 700$ H_a: $\mu \geq 700$

   ANS: PTS: 1 TOP: Hypothesis Tests

4. The average hourly wage of computer programmers with 2 years of experience has been $21.80. Because of high demand for computer programmers, it is believed there has been a significant increase in the average wage of computer programmers. To test whether or not there has been an increase, the correct hypotheses to be tested are
   a. H_0: $\mu < 21.80$ H_a: $\mu \geq 21.80$
   b. H_0: $\mu = 21.80$ H_a: $\mu \neq 21.80$
   c. H_0: $\mu > 21.80$ H_a: $\mu \leq 21.80$
   d. H_0: $\mu \leq 21.80$ H_a: $\mu > 21.80$

   ANS: PTS: 1 TOP: Hypothesis Tests

5. In the past, 75% of the tourists who visited Chattanooga went to see Rock City. The management of Rock City recently undertook an extensive promotional campaign. They are interested in determining whether the promotional campaign actually **increased** the proportion of tourists visiting Rock City. The correct set of hypotheses is
   a. H_0: $P > 0.75$ H_a: $P \leq 0.75$
   b. H_0: $P < 0.75$ H_a: $P \geq 0.75$
   c. H_0: $P \geq 0.75$ H_a: $P < 0.75$
   d. H_0: $P \leq 0.75$ H_a: $P > 0.75$

   ANS: PTS: 1 TOP: Hypothesis Tests

6. A soft drink filling machine, when in perfect adjustment, fills the bottles with 12 ounces of soft drink. Any over filling or under filling results in the shutdown and readjustment of the machine. To determine whether or not the machine is properly adjusted, the correct set of hypotheses is
   a. $H_0: \mu < 12$ $H_a: \mu \leq 12$
   b. $H_0: \mu \leq 12$ $H_a: \mu > 12$
   c. $H_0: \mu \neq 12$ $H_a: \mu = 12$
   d. $H_0: \mu = 12$ $H_a: \mu \neq 12$

   ANS: PTS: 1 TOP: Hypothesis Tests

7. The manager of an automobile dealership is considering a new bonus plan in order to increase sales. Currently, the mean sales rate per salesperson is five automobiles per month. The correct set of hypotheses for testing the effect of the bonus plan is
   a. $H_0: \mu < 5$ $H_a: \mu \leq 5$
   b. $H_0: \mu \leq 5$ $H_a: \mu > 5$
   c. $H_0: \mu > 5$ $H_a: \mu \leq 5$
   d. $H_0: \mu \geq 5$ $H_a: \mu < 5$

   ANS: PTS: 1 TOP: Hypothesis Tests

8. A weatherman stated that the average temperature during July in Chattanooga is 80 degrees or less. A sample of 32 Julys is taken. The correct set of hypotheses is
   a. $H_0: \mu \geq 80$ $H_a: \mu < 80$
   b. $H_0: \mu \leq 80$ $H_a: \mu > 80$
   c. $H_0: \mu \neq 80$ $H_a: \mu = 80$
   d. $H_0: \mu < 80$ $H_a: \mu > 80$

   ANS: PTS: 1 TOP: Hypothesis Tests

9. The sum of the values of α and β
   a. always add up to 1.0
   b. always add up to 0.5
   c. is the probability of Type II error
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Hypothesis Tests

10. The probability of committing a Type I error when the null hypothesis is true is
    a. the confidence level
    b. β
    c. greater than 1
    d. the Level of Significance

    ANS: PTS: 1 TOP: Hypothesis Tests

11. The level of significance is the
    a. maximum allowable probability of Type II error
    b. maximum allowable probability of Type I error
    c. same as the confidence coefficient
    d. same as the *p*-value

    ANS: PTS: 1 TOP: Hypothesis Tests

Tests of goodness of fit and independence

MULTIPLE CHOICE

1. A population where each element of the population is assigned to one and only one of several classes or categories is a
   a. multinomial population
   b. Poisson population
   c. normal population
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

2. A goodness of fit test is always conducted as a
   a. lower-tail test
   b. upper-tail test
   c. middle test
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

3. In order not to violate the requirements necessary to use the chi-square distribution, each expected frequency in a goodness of fit test must be
   a. at least 5
   b. at least 10
   c. no more than 5
   d. less than 2

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

   Exhibit 12-1
   When individuals in a sample of 150 were asked whether or not they supported capital punishment, the following information was obtained.

Do you support capital punishment?	Number of individuals
Yes	40
No	60
No Opinion	50

   We are interested in determining whether or not the opinions of the individuals (as to Yes, No, and No Opinion) are uniformly distributed.

4. Refer to Exhibit 12-1. The calculated value for the test statistic equals
   a. 2
   b. -2
   c. 20
   d. 4

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

5. Refer to Exhibit 12-1. The *p*-value is
   a. larger than 0.1
   b. less than 0.1
   c. less than 0.05
   d. larger than 0.9

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

Exhibit 12-2
Last school year, the student body of a local university consisted of 30% freshmen, 24% sophomores, 26% juniors, and 20% seniors. A sample of 300 students taken from this year's student body showed the following number of students in each classification.

Freshmen	83
Sophomores	68
Juniors	85
Seniors	64

We are interested in determining whether or not there has been a significant change in the classifications between the last school year and this school year.

6. Refer to Exhibit 12-2. The expected number of freshmen is
   a. 83
   b. 90
   c. 30
   d. 10

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

7. Refer to Exhibit 12-2. The calculated value for the test statistic equals
   a. 0.5444
   b. 300
   c. 1.6615
   d. 6.6615

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

8. Refer to Exhibit 12-2. At 95% confidence, the null hypothesis
   a. should not be rejected
   b. should be rejected
   c. was designed wrong
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

Exhibit 12-4
In the past, 35% of the students at ABC University were in the Business College, 35% of the students were in the Liberal Arts College, and 30% of the students were in the Education College. To see whether or not the proportions have changed, a sample of 300 students was taken. Ninety of the sample students are in the Business College, 120 are in the Liberal Arts College, and 90 are in the Education College.

9. Refer to Exhibit 12-4. The expected frequency for the Business College is
   a. 0.3
   b. 0.35
   c. 90
   d. 105

   ANS: PTS: 1 TOP: Goodness of Fit and Independence

10. Refer to Exhibit 12-4. The hypothesis is to be tested at the 5% level of significance. The critical value from the table equals
    a. 1.645
    b. 1.96
    c. 5.991
    d. 7.815

    ANS: PTS: 1 TOP: Goodness of Fit and Independence

11. Refer to Exhibit 12-4. The conclusion of the test is that the
    a. proportions have changed significantly
    b. proportions have not changed significantly
    c. test is inconclusive
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Goodness of Fit and Independence

12. The number of degrees of freedom for the appropriate chi-square distribution in a test of independence is
    a. n-1
    b. K-1
    c. number of rows minus 1 times number of columns minus 1
    d. a chi-square distribution is not used

    ANS: PTS: 1 TOP: Goodness of Fit and Independence

13. The degrees of freedom for a contingency table with 6 rows and 3 columns is
    a. 18
    b. 15
    c. 6
    d. 10

    ANS: PTS: 1 TOP: Goodness of Fit and Independence

Measure of association and simple linear regression

MULTIPLE CHOICE

1. A numerical measure of linear association between two variables is the
   a. variance
   b. covariance
   c. standard deviation
   d. coefficient of variation

   ANS: PTS: 1 TOP: Descriptive Statistics

2. A numerical measure of linear association between two variables is the
   a. variance
   b. coefficient of variation
   c. correlation coefficient
   d. standard deviation

   ANS: PTS: 1 TOP: Descriptive Statistics

3. The coefficient of correlation
   a. is the same as the coefficient of determination
   b. can be larger than 1
   c. cannot be larger than 1
   d. cannot be negative

   ANS: PTS: 1 TOP: Descriptive Statistics

4. In a regression analysis, the error term ε is a random variable with a mean or expected value of
   a. zero
   b. one
   c. any positive value
   d. any value

   ANS: PTS: 1 TOP: Regression Analysis

5. The mathematical equation relating the independent variable to the expected value of the dependent variable; that is, $E(y) = \beta_0 + \beta_1 x$, is known as
   a. regression equation
   b. correlation equation
   c. estimated regression equation
   d. regression model

   ANS: PTS: 1 TOP: Regression Analysis

6. A regression analysis between sales (Y in $1000) and advertising (X in dollars) resulted in the following equation

   $\hat{Y} = 30{,}000 + 4\,X$

   The above equation implies that an
   a. increase of $4 in advertising is associated with an increase of $4,000 in sales
   b. increase of $1 in advertising is associated with an increase of $4 in sales
   c. increase of $1 in advertising is associated with an increase of $34,000 in sales
   d. increase of $1 in advertising is associated with an increase of $4,000 in sales

   ANS: PTS: 1 TOP: Regression Analysis

7. In a simple regression analysis (where Y is a dependent and X an independent variable), if the Y intercept is positive, then
   a. there is a positive correlation between X and Y
   b. if X is increased, Y must also increase
   c. if Y is increased, X must also increase
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Regression Analysis

8. The equation that describes how the dependent variable (y) is related to the independent variable (x) is called
   a. the correlation model
   b. the regression model
   c. correlation analysis
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Regression Analysis

9. In a regression analysis, the variable that is being predicted
   a. must have the same units as the variable doing the predicting
   b. is the independent variable
   c. is the dependent variable
   d. usually is denoted by x

   ANS: PTS: 1 TOP: Regression Analysis

10. A regression analysis between sales (in $1000) and price (in dollars) resulted in the following equation

    $\hat{Y} = 60 - 8X$

    The above equation implies that an
    a. increase of $1 in price is associated with a decrease of $8 in sales
    b. increase of $8 in price is associated with an decrease of $52,000 in sales
    c. increase of $1 in price is associated with a decrease of $52 in sales
    d. increase of $1 in price is associated with a decrease of $8000 in sales

    ANS: PTS: 1 TOP: Regression Analysis

11. A regression analysis between demand (Y in 1000 units) and price (X in dollars) resulted in the following equation

$\hat{Y} = 9 - 3X$

The above equation implies that if the price is increased by $1, the demand is expected to
a. increase by 6 units
b. decrease by 3 units
c. decrease by 6,000 units
d. decrease by 3,000 units

ANS: PTS: 1 TOP: Regression Analysis

12. A least squares regression line
a. may be used to predict a value of y if the corresponding x value is given
b. implies a cause-effect relationship between x and y
c. can only be determined if a good linear relationship exists between x and y
d. None of these alternatives is correct.

ANS: PTS: 1 TOP: Regression Analysis

13. The coefficient of determination
a. cannot be negative
b. is the square root of the coefficient of correlation
c. is the same as the coefficient of correlation
d. can be negative or positive

ANS: PTS: 1 TOP: Regression Analysis

14. The value of the coefficient of correlation (R)
a. can be equal to the value of the coefficient of determination (R^2)
b. can never be equal to the value of the coefficient of determination (R^2)
c. is always smaller than the value of the coefficient of determination
d. is always larger than the value of the coefficient of determination

ANS: PTS: 1 TOP: Regression Analysis

15. In a regression analysis, the coefficient of determination is 0.4225. The coefficient of correlation in this situation is
a. 0.65
b. 0.1785
c. any positive value
d. any value

ANS: PTS: 1 TOP: Regression Analysis

16. Correlation analysis is used to determine
a. the equation of the regression line
b. the strength of the relationship between the dependent and the independent variables
c. a specific value of the dependent variable for a given value of the independent variable
d. None of these alternatives is correct.

ANS: PTS: 1 TOP: Regression Analysis

17. In a regression and correlation analysis if $r^2 = 1$, then
    a. SSE = SST
    b. SSE = 1
    c. SSR = SSE
    d. SSR = SST

    ANS: PTS: 1 TOP: Regression Analysis

18. In a regression analysis if SSE = 200 and SSR = 300, then the coefficient of determination is
    a. 0.6667
    b. 0.6000
    c. 0.4000
    d. 1.5000

    ANS: PTS: 1 TOP: Regression Analysis

19. If the coefficient of correlation is a positive value, then the regression equation
    a. must have a positive slope
    b. must have a negative slope
    c. could have either a positive or a negative slope
    d. must have a positive y intercept

    ANS: PTS: 1 TOP: Regression Analysis

20. In regression and correlation analysis, if SSE and SST are known, then with this information the
    a. coefficient of determination can be computed
    b. slope of the line can be computed
    c. Y intercept can be computed
    d. x intercept can be computed

    ANS: PTS: 1 TOP: Regression Analysis

21. SSE can never be
    a. larger than SST
    b. smaller than SST
    c. equal to 1
    d. equal to zero

    ANS: PTS: 1 TOP: Regression Analysis

22. If the coefficient of correlation is a negative value, then the coefficient of determination
    a. must also be negative
    b. must be zero
    c. can be either negative or positive
    d. must be positive

    ANS: PTS: 1 TOP: Regression Analysis

23. If two variables, x and y, have a strong linear relationship, then
    a. there may or may not be any causal relationship between x and y
    b. x causes y to happen
    c. y causes x to happen
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Regression Analysis

24. If all the points of a scatter diagram lie on the least squares regression line, then the coefficient of determination for these variables based on these data is
    a. 0
    b. 1
    c. either 1 or -1, depending upon whether the relationship is positive or negative
    d. could be any value between -1 and 1

    ANS: PTS: 1 TOP: Regression Analysis

25. In a regression analysis if SST = 500 and SSE = 300, then the coefficient of determination is
    a. 0.20
    b. 1.67
    c. 0.60
    d. 0.40

    ANS: PTS: 1 TOP: Regression Analysis

26. If the coefficient of correlation is 0.4, the percentage of variation in the dependent variable explained by the variation in the independent variable
    a. is 40%
    b. is 16%.
    c. is 4%
    d. can be any positive value

    ANS: PTS: 1 TOP: Regression Analysis

27. If the coefficient of correlation is 0.90, then the coefficient of determination
    a. is also 0.9
    b. is either 0.81 or -0.81
    c. can be either negative or positive
    d. must be 0.81

    ANS: PTS: 1 TOP: Regression Analysis

28. If the coefficient of correlation is a positive value, then
    a. the intercept must also be positive
    b. the coefficient of determination can be either negative or positive, depending on the value of the slope
    c. the regression equation could have either a positive or a negative slope
    d. the slope of the line must be positive

    ANS: PTS: 1 TOP: Regression Analysis

Exhibit 14-3
You are given the following information about y and x.

y Dependent Variable	x Independent Variable
12	4
3	6
7	2
6	4

29. Refer to Exhibit 14-3. The least squares estimate of b_1 equals
    a. 1
    b. -1
    c. -11
    d. 11

    ANS: PTS: 1 TOP: Regression Analysis

30. Refer to Exhibit 14-3. The sample correlation coefficient equals
    a. -0.4364
    b. 0.4364
    c. -0.1905
    d. 0.1905

    ANS: PTS: 1 TOP: Regression Analysis

Exhibit 14-6
For the following data the value of SSE = 0.4130.

y Dependent Variable	x Independent Variable
15	4
17	6
23	2
17	4

31. Refer to Exhibit 14-6. The slope of the regression equation is
    a. 18
    b. 24
    c. 0.707
    d. -1.5

    ANS: PTS: 1 TOP: Regression Analysis

32. Refer to Exhibit 14-6. The total sum of squares (SST) equals
    a. 36
    b. 18
    c. 9
    d. 1296

    ANS: PTS: 1 TOP: Regression Analysis

Exhibit 14-7
You are given the following information about y and x.

y Dependent Variable	x Independent Variable
5	4
7	6
9	2
11	4

33. Refer to Exhibit 14-7. The least squares estimate of b_1 (slope) equals
    a. -10
    b. 10
    c. 0.5
    d. -0.5

    ANS: PTS: 1 TOP: Regression Analysis

34. Refer to Exhibit 14-7. The sample correlation coefficient equals
    a. 0.3162
    b. -0.3162
    c. 0.10
    d. -0.10

    ANS: PTS: 1 TOP: Regression Analysis

Exhibit 14-9
A regression and correlation analysis resulted in the following information regarding a dependent variable (y) and an independent variable (x).

$\Sigma X = 90$
$\Sigma Y = 170$
$n = 10$
$SSE = 505.98$
$\Sigma (Y - \bar{Y})(X - \bar{X}) = 466$
$\Sigma (X - \bar{X})^2 = 234$
$\Sigma (Y - \bar{Y})^2 = 1434$

35. Refer to Exhibit 14-9. The least squares estimate of b_1 equals
    a. 0.923
    b. 1.991
    c. -1.991
    d. -0.923

    ANS: PTS: 1 TOP: Regression Analysis

36. Refer to Exhibit 14-9. The sum of squares due to regression (SSR) is
    a. 1434
    b. 505.98
    c. 50.598
    d. 928.02

    ANS: PTS: 1 TOP: Regression Analysis

Multiple regression

MULTIPLE CHOICE

1. The mathematical equation relating the expected value of the dependent variable to the value of the independent variables, which has the form of E(y) = $\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p$ is
   a. a simple linear regression model
   b. a multiple nonlinear regression model
   c. an estimated multiple regression equation
   d. a multiple regression equation

   ANS: PTS: 1 TOP: Multiple Regression

2. The mathematical equation that explains how the dependent variable y is related to several independent variables $x_1, x_2, \ldots, x_p$ and the error term ε is
   a. a simple nonlinear regression model
   b. a multiple regression model
   c. an estimated multiple regression equation
   d. a multiple regression equation

   ANS: PTS: 1 TOP: Multiple Regression

3. A multiple regression model has
   a. only one independent variable
   b. more than one dependent variable
   c. more than one independent variable
   d. at least 2 dependent variables

   ANS: PTS: 1 TOP: Multiple Regression

4. A regression model in which more than one independent variable is used to predict the dependent variable is called
   a. a simple linear regression model
   b. a multiple regression model
   c. an independent model
   d. None of these alternatives is correct.

   ANS: PTS: 1 TOP: Multiple Regression

5. A multiple regression model has the form

   $\hat{Y}$=5+6X+7W

   As X increases by 1 unit (holding W constant), Y is expected to
   a. increase by 11 units
   b. decrease by 11 units
   c. increase by 6 units
   d. decrease by 6 units

   ANS: PTS: 1 TOP: Multiple Regression

Exhibit 15-4

a. $Y=\beta_0+\beta_1X_1+\beta_2X_2+\varepsilon$
b. $E(Y)=\beta_0+\beta_1X_1+\beta_2X_2+\varepsilon$
c. $\hat{Y}=b_0+b_1X_1+b_2X_2$
d. $E(Y)=\beta_0+\beta_1X_1+\beta_2X_2$

6. Which equation gives the estimated regression line?
   a. Equation A
   b. Equation B
   c. Equation C
   d. Equation D

   ANS: PTS: 1 TOP: Multiple Regression

7. A measure of goodness of fit for the estimated regression equation is the
   a. multiple coefficient of determination
   b. mean square due to error
   c. mean square due to regression
   d. sample size

   ANS: PTS: 1 TOP: Multiple Regression

8. The adjusted multiple coefficient of determination is adjusted for
   a. the number of dependent variables
   b. the number of independent variables
   c. the number of equations
   d. detrimental situations

   ANS: PTS: 1 TOP: Multiple Regression

9. In a multiple regression analysis involving 15 independent variables and 200 observations, SST = 800 and SSE = 240. The coefficient of determination is
   a. 0.300
   b. 0.192
   c. 0.500
   d. 0.700

   ANS: PTS: 1 TOP: Multiple Regression

10. The correct relationship between SST, SSR, and SSE is given by
    a. SSR = SST + SSE
    b. SSR = SST - SSE
    c. SSE = SSR - SST
    d. None of these alternatives is correct.

    ANS: PTS: 1 TOP: Multiple Regression

11. In a multiple regression analysis involving 10 independent variables and 81 observations, SST = 120 and SSE = 42. The coefficient of determination is
    a. 0.81
    b. 0.11
    c. 0.35
    d. 0.65

    ANS: PTS: 1 TOP: Multiple Regression

12. In a multiple regression analysis involving 5 independent variables and 30 observations, SSR = 360 and SSE = 40. The coefficient of determination is
    a. 0.80
    b. 0.90
    c. 0.25
    d. 0.15

    ANS: PTS: 1 TOP: Multiple Regression

13. In a multiple regression model, the error term ε is assumed to be a random variable with a mean of
    a. zero
    b. -1
    c. 1
    d. any value

    ANS: PTS: 1 TOP: Multiple Regression

14. In a multiple regression model, the values of the error term ,ε, are assumed to be
    a. zero
    b. dependent on each other
    c. independent of each other
    d. always negative

    ANS: PTS: 1 TOP: Multiple Regression

15. In order to test for the significance of a regression model involving 3 independent variables and 47 observations, the numerator and denominator degrees of freedom (respectively) for the critical value of F are
    a. 47 and 3
    b. 3 and 47
    c. 2 and 43
    d. 3 and 43

    ANS: PTS: 1 TOP: Multiple Regression

16. A term used to describe the case when the independent variables in a multiple regression model are correlated is
    a. regression
    b. correlation
    c. multicollinearity
    d. None of the above answers is correct.

    ANS: PTS: 1 TOP: Multiple Regression