Provide an appropriate response.

1) The 1995 payroll amounts for all major league baseball teams are shown below. What percentage of the payrolls were in the $20-30 million range?

A) 38%  
B) 11%  
C) 59%  
D) 10%
2) In a comprehensive road test on all new car models, one variable measured is the time it takes a car to accelerate from 0 to 60 miles per hour. To model acceleration time, a regression analysis is conducted on a random sample of 129 new cars.

TIME60: \( y = \) Elapsed time (in seconds) from 0 mph to 60 mph
MAX: \( x_1 = \) Maximum speed attained (miles per hour)

Initially, the simple linear model \( E(y) = \beta_0 + \beta_1 x_1 \) was fit to the data. Computer printouts for the analysis are given below:

**UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF TIME60**

<table>
<thead>
<tr>
<th>PREDICTOR</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>STUDENT'S T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>18.7171</td>
<td>0.63708</td>
<td>29.38</td>
<td>0.0000</td>
</tr>
<tr>
<td>MAX</td>
<td>-0.08365</td>
<td>0.00491</td>
<td>-17.05</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-QUARED 0.6960 RESID. MEAN SQUARE (MSE) 1.28695
ADJUSTED R-QUARED 0.6937 STANDARD DEVIATION 1.13444

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGRESSION</td>
<td>1</td>
<td>374.285</td>
<td>374.285</td>
<td>290.83</td>
<td>0.0000</td>
</tr>
<tr>
<td>RESIDUAL</td>
<td>127</td>
<td>163.443</td>
<td>1.28695</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>128</td>
<td>537.728</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CASES INCLUDED 129   MISSING CASES 0

Approximately what percentage of the sample variation in acceleration time can be explained by the simple linear model?

A) 70%  
B) -17%  
C) 0%  
D) 8%

3) The variable measured in the experiment is called ___________.

A) the treatment  
B) a sampling unit  
C) the predictor variable  
D) the response variable

4) Use the spinner below to answer the question. Assume that it is equally probable that the pointer will land on any one of the five numbered spaces. If the pointer lands on a borderline, spin again.

Find the probability that the arrow will land on an odd number.

A) 0  
B) \( \frac{2}{5} \)  
C) 1  
D) \( \frac{3}{5} \)

5) Given the following five-number summary, find the interquartile range.

29, 37, 50, 66, 94

A) 50  
B) 29  
C) 32.5  
D) 65
6) Find the equation of the regression line for the given data.

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c}
 x & -5 & -3 & 1 & -1 & 0 & 2 & 3 & 4 & 8 \\
 y & 11 & 6 & -6 & 3 & 4 & 1 & -4 & -5 & 8 \\
\end{array}
\]

A) \( y = -1.885x + 0.758 \)  
B) \( y = 0.758x + 1.885 \)  
C) \( y = -0.758x - 1.885 \)  
D) \( y = 1.885x - 0.758 \)

7) The top speeds (in mph) for a sample of five new automobile brands are listed below. Calculate the standard deviation of the speeds.
160, 140, 190, 170, 115

A) 75 mph  
B) 22,242.50 mph  
C) 155.00 mph  
D) 28.7 mph

8) The number of students enrolled in a physics class for the last ten semesters are listed below. Find the median number of students.

65, 66, 67, 66, 67, 70, 67, 71, 68

A) 66 students  
B) 68 students  
C) 70 students  
D) 67 students

9) In 1999 the stock market took big swings up and down. A survey of 1006 adult investors asked how often they tracked their portfolio. The table shows the investor responses. What is the probability that an adult investor tracks his or her portfolio daily? Express your answer as a simplified fraction and as a decimal rounded to three decimal places.

<table>
<thead>
<tr>
<th>How frequently?</th>
<th>Response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>275</td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>287</td>
<td></td>
</tr>
<tr>
<td>Couple times a year</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>Don’t track</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

A) \( \frac{275}{1006} ; 0.273 \)  
B) \( \frac{287}{1006} ; 0.285 \)  
C) \( \frac{144}{1006} ; 0.143 \)  
D) \( \frac{240}{1006} ; 0.239 \)

10) The table lists the drinking habits of a group of college students. If a student is chosen at random, find the probability of getting someone who is a regular or heavy drinker. Round your answer to three decimal places.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Non-drinker</th>
<th>Regular Drinker</th>
<th>Heavy Drinker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>135</td>
<td>39</td>
<td>5</td>
<td>179</td>
</tr>
<tr>
<td>Woman</td>
<td>187</td>
<td>21</td>
<td>13</td>
<td>221</td>
</tr>
<tr>
<td>Total</td>
<td>322</td>
<td>60</td>
<td>18</td>
<td>400</td>
</tr>
</tbody>
</table>

A) 0.224  
B) 0.667  
C) 0.130  
D) 0.195

11) The monthly telephone usage (in minutes) of 30 adults is listed below. Find the interquartile range for the telephone usage of the 30 adults.

154, 156, 165, 165, 170, 171, 172, 180, 184, 185, 189, 189, 190, 192, 195, 198, 198, 200, 200, 200, 205, 205, 211, 215, 220, 220, 225, 238, 255, 265

A) 32  
B) 29  
C) 30  
D) 31
12) At a tennis tournament a statistician keeps track of every serve. The statistician reported that the mean serve speed of a particular player was 102 miles per hour (mph) and the standard deviation of the serve speeds was 10 mph. If nothing is known about the shape of the distribution, give an interval that will contain the speeds of at least eight-ninths of the player’s serves.

A) 72 mph to 132 mph  
B) 132 mph to 162 mph  
C) 62 mph to 142 mph  
D) 82 mph to 122 mph

13) Which type of bias occurs because we do not obtain complete information about a population?

A) response bias  
B) sampling bias  
C) nonresponse bias  
D) no bias

14) What is the difference between a bar chart and a histogram?

A) The bars in a bar chart may be of various widths while the bars of a histogram are all the same width.  
B) The bars in a bar chart are all the same width while the bars of a histogram may be of various widths.  
C) The bars on a bar chart do not touch while the bars of a histogram do touch.  
D) There is no difference between these two graphical displays.

15) A researcher determines that the linear correlation coefficient is 0.85 for a paired data set. This indicates that there is

A) a strong negative linear correlation.  
B) a strong positive linear correlation.  
C) no linear correlation but that there may be some other relationship.  
D) insufficient evidence to make any decision about the correlation of the data.

16) Which of the following is not true about factors?

A) Factors whose effect on the response variable interests us should be set at predetermined levels.  
B) Any combination of the values of the factors is called a treatment.  
C) Factors whose effect on the response variable is not of interest can be set after the experiment.  
D) One way to control factors is to fix their level at one predetermined value throughout the experiment.

17) The government of a town needs to determine if the city’s residents will support the construction of a new town hall. The government decides to conduct a survey of a sample of the city’s residents. Which one of the following procedures would be most appropriate for obtaining a sample of the town’s residents?

A) Survey a random sample of persons within each geographic region of the city.  
B) Survey every 5th person who walks into city hall on a given day.  
C) Survey a random sample of employees at the old city hall.  
D) Survey the first 300 people listed in the town’s telephone directory.
18) The peak shopping time at a pet store is between 8-11:00 am on Saturday mornings. Management at the pet store randomly selected 130 customers last Saturday morning and decided to observe their shopping habits. They recorded the number of items that a sample of the customers purchased as well as the total time the customers spent in the store. Identify the types of variables recorded by the pet store.
   A) number of items - continuous; total time - discrete
   B) number of items - discrete; total time - discrete
   C) number of items - discrete; total time - continuous
   D) number of items - continuous; total time - continuous

19) Find the z-score for the value 60, when the mean is 86 and the standard deviation is 8.
   A) $z = -3.25$  B) $z = 0.60$  C) $z = -3.37$  D) $z = -0.60$

20) The table below summarizes the weights of almonds (in grams) for the almonds in a one pound bag. What is the class width of the classes?

<table>
<thead>
<tr>
<th>Weight (g)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7585-0.8184</td>
<td>1</td>
</tr>
<tr>
<td>0.8185-0.8784</td>
<td>1</td>
</tr>
<tr>
<td>0.8785-0.9384</td>
<td>1</td>
</tr>
<tr>
<td>0.9385-0.9984</td>
<td>3</td>
</tr>
<tr>
<td>0.9985-1.0584</td>
<td>157</td>
</tr>
<tr>
<td>1.0585-1.1184</td>
<td>171</td>
</tr>
<tr>
<td>1.1185-1.1784</td>
<td>8</td>
</tr>
</tbody>
</table>

   A) 0.408  B) 0.06  C) 0.059  D) 0.4

Classify the variable as qualitative or quantitative.
   21) the number of seats in a school auditorium
      A) quantitative  B) qualitative

   22) the colors of book covers on a bookshelf
      A) qualitative  B) quantitative
The bar graph shows the number of tickets sold each week by the garden club for their annual flower show.

![Bar Graph]

23) During which week was the most number of tickets sold?
   A) week 2   B) week 1   C) week 4   D) week 5

Determine the sampling technique which is used.

24) To avoid working late, the plant foreman inspects the first 10 microwaves produced that day. What sampling technique was used?
   A) stratified   B) convenience   C) cluster   D) random   E) systematic

25) Thirty-five math majors, 43 music majors and 26 history majors are randomly selected from 496 math majors, 278 music majors and 336 history majors at the state university. What sampling technique is used?
   A) systematic   B) convenience   C) random   D) cluster   E) stratified

Construct a frequency distribution for the data using five classes. Describe the shape of the distribution.

26) The data set: ages of dishwashers (in years) in 20 randomly selected households
   12  6  4  9  11  1  7  8  9  8  9  13  5  15  7  6  8  8  2  1
   A) skewed to the right   B) uniform   C) skewed to the left   D) bell shaped
Provide an appropriate response. Round relative frequencies to thousandths.

27) True or False: Relative frequency is the proportion (or percent) of observations within a category and is found using the formula: relative frequency = \( \frac{\text{sum of all frequencies}}{\text{frequency}} \).

A) True  
B) False

Determine whether the quantitative variable is discrete or continuous.

28) the cholesterol levels of a group of adults the day after Thanksgiving

A) discrete  
B) continuous

29) the weight of a player on the wrestling team

A) discrete  
B) continuous

Find the sample standard deviation.

30) 5, 5, 5, 8, 11, 11, 11

A) 3 
B) 7.7 
C) 9.0 
D) 2.8

31) Which of the following is not true of statistics?

A) Statistics can be used to organize and analyze information.
B) Statistics is used to draw conclusions using data.
C) Statistics involves collecting and summarizing data.
D) Statistics is used to answer questions with 100% certainty.
Use the scatter diagrams shown, labeled a through f to solve the problem.

32) In which scatter diagram is \( r = 0.01 \)?

A) e  B) d  C) c  D) f

Determine the level of measurement of the variable.

33) weight of rice bought by a customer
A) ordinal  B) interval  C) ratio  D) nominal

34) the musical instrument played by a music student
A) interval  B) ordinal  C) nominal  D) ratio

Compute the linear correlation coefficient between the two variables and determine whether a linear relation exists.

35) 
\[
\begin{array}{cccc}
\text{x} & 2 & 3 & 5 \\
\text{y} & 1.3 & 1.6 & 2.1 & 2.2 & 2.7 & 6 \\
\end{array}
\]
A) \( r = 0.983 \); linear relation exists  B) \( r = 0.883 \); no linear relation exists  
C) \( r = 0.883 \); linear relation exists  D) \( r = 0.983 \); no linear relation exists
36) Quantitative variables classify individuals in a sample according to
   A) personality characteristic.  B) physical attribute.
   C) exhibited trait.  D) numerical measure.

Describe the shape of the distribution.

37) A) skewed to the right  B) uniform  C) skewed to the left  D) bell shaped