1. A study is conducted on students taking a statistic class. Several variables are recorded in the survey. Which variables are quantitative?

A) Type of car the student owns:  
B) Number of credit hours taken during that semester.  
C) The time the student waited in line at the bookstore to pay for his/her textbooks.  
D) Home state of the student.  
E) B and C

2. A pie chart of the departments in the school/college from which the 1100 sampled students graduated is shown below.

Based on the graph, (approximately) how many of the sampled students graduated with a degree in Construction or Architecture?

A) 35  
B) 65  
C) 45  
D) 25

3. A distributor of appliances is doing a customer satisfaction survey for a manufacturer of DVD players. A sample of 68 clients is asked to rate a particular DVD player on a 1 to 10 scale, where 1 corresponds to the worst rating and 10 to the best rating. A bar graph of the ease of use ratings classified by gender is given below.

What percentage of the sampled female clients rated the DVD player as not so easy to use (a rating of 4 or lower)?
The histogram below represents the height (in inches) of the gold medal–winning high jumps for the Olympic Games up to Sydney 2000. (100 Jumps Total)

4. What is approximately the mean height?

A) 75 inches  
B) 77.5 inches  
C) 82 inches  
D) 90 inches

5. What is approximately the percentage of these winning jumps that were at least 7’1” high (85 inches)? (100 Jumps Total)

A) 9%  
B) 14%  
C) 23%  
D) 35%

6. A consumer group surveyed the prices for white cotton extra-long twin sheet sets in five different department stores and reported the average price as $16. We visited four of the five stores, and found the prices to be $12, $15, $17, and $22. Assuming that the consumer group is correct, what is the price of the item at the store that we did not visit?

A) 10  
B) 14  
C) 15  
D) 17
7. Data on the mileage of 20 randomly selected cars is listed below. The values are ordered for convenience.

12  13  15  16  16  17  18  18  19  19
20  20  22  23  24  26  26  27  27  29

What is the median mileage for these 20 cars?

A) 17.5  B) 19  C) 19.5  D) 20

8. A set of midterm exam scores has a median that is much larger than the mean. Which of the following statements is most consistent with this information?

A) A stemplot of the data would be symmetric.
B) A stemplot of the data would be skewed left.
C) A stemplot of the data would be skewed right.
D) The data set must be so large that it would be better to draw a histogram rather than a stemplot.

9. Which of the following is likely to have a mean that is smaller than the median?

A) The salaries of all National Football League players.
B) The scores of students (out of 100 points) on a very easy exam in which most score perfectly, but a few do very poorly.
C) The prices of homes in a large city.
D) The scores of students (out of 100 points) on a very difficult exam on which most score poorly, but a few do very well.

10. The salaries of major league baseball players range from several hundred thousand dollars per year to many millions. Suppose a histogram is made of all last year’s salaries of major league baseball players. Which shape would best describe the shape of this histogram?

A) Skewed to the left
B) Bell shaped
C) Skewed to the right
D) Bimodal
11. What is the five-number summary?
A) 175, 234, 299, 345, 549
B) 175, 219.5, 299, 350, 549
C) 175, 219.5, 299, 350, 384
D) 175, 234, 299, 331, 549

IQR = 111

12. Which of the following is true?
A) No outliers present
B) One outlier: 175
C) One outlier: 549
D) Two outliers: 175 and 549

13. The time to complete a standardized exam is approximately normal with a mean of 70 minutes and a standard deviation of 10 minutes. Using the 68-95-99.7 rule, what percentage of students will complete the exam in under an hour?
A) 68%
B) 32%
C) 16%
D) 5%

14. What is the area under the standard normal curve corresponding to $Z > -1.22$?
A) 0.1151
B) 0.1112
C) 0.8849
D) 0.8888

15. When creating a scatterplot, one should use the________ axis for the explanatory variable.
A) horizontal
B) vertical
C) the line $y = x$
D) the line $y = -x$

16. A researcher is interested in determining if one could predict the score on a statistics exam from the amount of time spent studying for the exam. Students were allowed to use calculators for this exam. Which variable is the explanatory variable in this study.
A) scores on the statistics exam
B) students’ GPA
C) type of calculator used in the class
D) amount of time spent studying for the exam

17. The height (in feet) and volume of usable lumber (in cubic feet) of 32 cherry trees are measured by a researcher. The goal is to determine if the volume of usable lumber can be estimated from the height of a tree. The results are plotted below.
The response variable in this study is
A) height of the trees       B) the 32 cherry trees
C) volume of usable lumber  D) none of the above

18. Which of the following is true for the scatter plot above?
A) There is a positive association between height and volume.
B) There is a negative association between height and volume.
C) There is an outlier in the plot.
D) The plot is skewed to the left.
E) A and C are true

19. A student wonders if people of similar heights tend to date each other. She measures herself, her dormitory roommate, and the women in the adjoining rooms; then she measures the next man whom each woman dates. Here are the data (heights in inches):

<table>
<thead>
<tr>
<th>Women</th>
<th>64</th>
<th>65</th>
<th>65</th>
<th>66</th>
<th>66</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>68</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td>72</td>
<td>74</td>
</tr>
</tbody>
</table>

Which of the following statements is true?
A) If we had measured the heights of the men and women in centimeters (1 inch = 2.5 cm), the correlation coefficient would have been 2.5 times larger.
B) There is a strong negative association between the heights of men and women because the women are always smaller than the men they date.
C) There is a positive association between the heights of men and women.
D) Any height above 70 inches must be considered an outlier.
E) A and B are true
20. A study found a correlation of \( r = -0.61 \) between the gender of a worker and his or her income. Which of the following is true?

A) Women earn more than men on the average.
B) Women earn less than men on the average.
C) An arithmetic mistake was made. Correlation must be positive.
D) This measurement makes no sense; \( r \) can only be measured between two quantitative variables.

21. As Swiss cheese matures, a variety of chemical processes take place. The taste of matured cheese is related to the concentration of several chemicals in the final product. In a study of cheese in a certain region of Switzerland, samples of cheese were analyzed for lactic acid concentration and were subjected to taste tests. The numerical taste scores were obtained by combining the scores from several tasters. A scatterplot of the observed data is shown below.

What is a plausible value for the correlation between lactic acid concentration and taste rating?

A) 0.999  B) 0.7  C) 0.07  D) -0.7

22. In a statistics course, a linear regression equation was computed to predict the final exam score from the score on the midterm exam. The equation of the least-squares regression line was \( \hat{y} = 10 + 0.9x \), where \( y \) represents the final exam score and \( x \) is the midterm exam score. Suppose Joe scores a 90 on the midterm exam. What would be the predicted value of his score on the final exam?

A) 81  B) 89  C) 91  D) Cannot be determined from the information given. We also need to know the correlation.
ANSWER KEY

1. E
2. B
3. C
4. C
5. D
6. B
7. C
8. B
9. B
10. C
11. A
12. C
13. C
14. D
15. A
16. D
17. C
18. E
19. C
20. D
21. B
22. C