MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) A historian wants to estimate the average age at marriage for women in New England in the early nineteenth century. Within her state archives she finds marriage records for the years 1800-1820. She takes a sample of those records, noting the age of the bride for each. She calculates the mean age in the sample as 24.1 years and concludes women married on average at 24.1 years.

A) Descriptive, because it summarizes the data collected  
B) Descriptive, because it makes predictions about the population  
C) Inferential, because it makes predictions about the population  
D) Inferential, because it summarizes the data collected  
E) None of the above.

2) A numerical summary of the population is called  
A) A statistic  
B) A variable  
C) A census  
D) A parameter  
E) A data file

3) Every other year, the National Opinion Research Center at the University of Chicago conducts the General Social Survey (GSS). This survey of a few thousand adult Americans provides data about the opinions and behavior of the American public. The population of interest is  
A) The researchers at the University of Chicago  
B) The few thousand adult Americans who participated in the survey  
C) All the universities in the United States  
D) set of all Americans  
E) All the adult Americans at the University of Chicago

4) The total playing time of a CD is what type of a variable  
A) Qualitative  
B) Quantitative  
C) Mixed  
D) Homogeneous  
E) Heterogeneous

5) Brandon kept track of the number of hours he spent exercising each week. The results for four months are shown below. Find the median number of hours Brandon spent exercising per week.

<table>
<thead>
<tr>
<th>Hours</th>
<th>7.50</th>
<th>8.20</th>
<th>7.10</th>
<th>7.90</th>
<th>8.00</th>
<th>7.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>hours</td>
<td>7.80</td>
<td>7.10</td>
<td>7.30</td>
<td>7.50</td>
<td>7.90</td>
<td>8.90</td>
</tr>
<tr>
<td>hours</td>
<td>7.10</td>
<td>8.20</td>
<td>8.20</td>
<td>8.00</td>
<td>7.80</td>
<td></td>
</tr>
</tbody>
</table>

A) 7.80  
B) 7.85  
C) 8.00  
D) 8.05  
E) 7.50

6) The cost (in dollars) of laptops are given below for a sample of eight new college students.  

A) 115.1  
B) 167.74  
C) 156.90  
D) 670  
E) 123.1

7) Consider the cost of laptops again, what is the interquartile range, (pick the closest answer)?

A) 1600.5  
B) 30.3  
C) 192.5 (245ok)  
D) 350.5  
E) 370.5
8) A nurse measured systolic blood pressure (SBP) of each person who visited her clinic. Following is a relative-frequency histogram. The shape of the histogram is

\[
\begin{array}{c}
\text{Relative Frequency} \\
0.40 & 0.35 & 0.30 & 0.25 & 0.20 & 0.15 & 0.10 & 0.05 & 0.00 \\
\text{Systolic Blood Pressure (mm Hg)} \\
100 & 110 & 120 & 130 & 140 & 150 & 160 \\
\end{array}
\]

A) right-skewed  B) left-skewed  C) symmetric  D) bimodal  E) trough-shaped

9) A relative frequency histogram for the heights of a sample of adult women is shown below. Approximately what proportion of the heights of adult women is between 63 to 66 inches.

\[
\begin{array}{c}
\text{Relative Frequency} \\
0.40 & 0.30 & 0.25 & 0.20 & 0.15 & 0.10 & 0.05 & 0.00 \\
\text{Height (inches)} \\
59 & 60 & 61 & 62 & 63 & 64 & 65 & 66 & 67 & 68 & 69 & 70 \\
\end{array}
\]

A) 40%  B) 60%  C) 4%  D) 52.5%  E) None of the above

10) The partially filled contingency table gives the frequencies of the data on number of hours of home religious activity and gender, which comes from a recent General Social Survey.

<table>
<thead>
<tr>
<th>Number of Hours of Home Religious Activity</th>
<th>0</th>
<th>1-19</th>
<th>20 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>376</td>
<td>302</td>
<td>156</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>229</td>
<td>485</td>
<td>152</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>595</td>
<td>791</td>
<td>270</td>
<td>1156</td>
</tr>
</tbody>
</table>

Given that the resident is male, what is the proportion of people who have 1-19 hours’ home religious activity?

A) 0.301  B) 0.422  C) 0.615  D) 0.485  E) 0.362
11) Suppose you were to collect data for the pair of given variables in order to make a scatterplot. Identify the classification that correctly identifies response and explanatory variable.
Variables: Weight loss (lb), time spend on exercise every day
A) Weight loss: response variable
   Time spend on exercise every day: explanatory variable
B) Weight loss: explanatory variable
   Time spend on exercise every day: response variable
C) Weight loss: response variable
   Time spend on exercise every day: both
D) Weight loss: both
   Time spend on exercise every day: response variable
E) Weight loss: explanatory variable
   Time spend on exercise every day: both

12) Six pairs of data yield the regression equation $y=3x+4$. What is the best predicted value of $y$ for $x=4.1$?
A) 12.1
B) 7.0
C) 21.40
D) 8.3
E) 16.3

13) Graphically in the scatterplot, the vertical distance between a certain observation point and the regression line is called ________________.
A) Intercept
B) Interpolation
C) Residual
D) Predicted value
E) Outlier

14) The following results were obtained from a regression; $r = -0.5$, $S_x = 0.5$, $S_y = 4$, $\bar{x} = 5$, $\bar{y} = 18$.
Find the regression equation $\hat{y} = a + bx$.
A) $38 - 4x$
B) $38 + 4x$
C) $43 - 5x$
D) $43 + 5x$
E) $143 - 5x$

15) In a study by Swedish researchers, 2410 women who had worked as hairdressers and given birth to children were compared to 3462 women from the general population who had given birth. They found that the hairdressers had a slightly higher percentage of infants with a birth defect. What type of study is this?
A) Experimental
B) Observational
C) Survey
D) Census
E) Hypothetical

16) An experiment consists of tossing 4 fair coins simultaneously. The number of sample points in this experiment is:
A) 4
B) 8
C) 16
D) 32
E) 64

17) If $P(A) = 0.4$, $P(B) = 0.3$ and $P(A \cup B) = 0.60$, then $P(A \cap B)$ is
A) 0.12
B) 0.30
C) 0.70
D) 0.20
E) 0.10

18) An urn contains 4 red and 6 yellow balls. Two balls are randomly drawn without replacement. What is the probability of two yellow?
A) 0.20
B) 0.33
C) 0.60
D) 0.40
E) 0.50

19) 40% of students change majors and 70% change from a science to a social science major among those who change their major. What is the probability a randomly chosen student is changing to a social science major?
A) 0.40
B) 0.80
C) 0.28
D) 0.30
E) 0.20
20) The table below describes the smoking habits of a group of asthma sufferers.

<table>
<thead>
<tr>
<th></th>
<th>Light Nonsmoker</th>
<th>Heavy smoker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>395</td>
<td>63</td>
<td>79</td>
</tr>
<tr>
<td>Women</td>
<td>363</td>
<td>86</td>
<td>67</td>
</tr>
<tr>
<td>Total</td>
<td>758</td>
<td>149</td>
<td>146</td>
</tr>
</tbody>
</table>

What is the probability that a subject is a heavy smoker?
A) 0.345          B) 0.075          C) 0.479          D) 0.147          E) 0.139

TRUE/FALSE. Mark a TRUE statement with 1 and a FALSE statement with 2 on the scantron.

21) A histogram is a graphical display for two quantitative variables. **FALSE**

22) Identification of patterns in the data is an element of descriptive statistics. **TRUE**

23) A census is a special type of experimental study. **FALSE**

24) In a left skewed distribution, the value of the median is bigger than the value of mean. **TRUE**

25) If P(A) = 0.5, P(B) = 0.6, and P(A∩B) = 0.20, then the events A and B are independent. **FALSE**

26) In an observational study, the researcher observes values of the response variable and explanatory variables for the sampled subjects, without manipulating the explanatory variable. **TRUE**

27) The closer r is to 1, the weaker is the positive linear association between the variables. **FALSE**

28) If, because of the possible legal consequences, many people in a sample of the U.S. population choose not to participate in a survey regarding illegal drug use, non-response becomes a problem. **TRUE**

29) A study wants to know people’s preference on the operating systems among Windows (A), Mac OS (B), and Linux (C) users (one can have only one preference). They found that P(A) = ½, P(B) = 1/3, P(C) = 1/4. These probabilities are possible. **FALSE**

30) If P(AnB) = P(A), and 0 < P(A)<1, 0 < P(B)<1, then events A and event B are independent **FALSE**