PRACTICE TEST!

Name__________________________________________

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

Determine whether the given value is a statistic or a parameter.

1) A sample of 120 employees of a company is selected, and the average age is found to be 37 years. 1) ______
   A) Statistic                      B) Parameter

2) After taking the first exam, 15 of the students dropped the class. 2) ______
   A) Parameter                      B) Statistic

Identify the number as either continuous or discrete.

3) The total number of phone calls a sales representative makes in a month is 425. 3) ______
   A) Continuous                        B) Discrete

4) The height of 2-year-old maple tree is 28.3 ft. 4) ______
   A) Continuous                        B) Discrete

Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.

5) The temperatures of eight different plastic spheres. 5) ______
   A) Ordinal                           B) Nominal
   C) Interval                          D) Ratio

6) Ages of survey respondents. 6) ______
   A) Ratio                             B) Nominal
   C) Ordinal                           D) Interval

7) The subjects in which college students major. 7) ______
   A) Ordinal                           B) Nominal
   C) Interval                          D) Ratio

8) Salaries of college professors. 8) ______
   A) Ordinal                           B) Nominal
   C) Ratio                             D) Interval

9) The sample of spheres categorized from softest to hardest. 9) ______
   A) Interval                          B) Ratio
   C) Ordinal                           D) Nominal

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Identify the sample and population. Also, determine whether the sample is likely to be representative of the population.

10) An employee at the local ice cream parlor asks three customers if they like chocolate ice cream. 10) ____________

11) In a poll of 50,000 randomly selected college students, 74% answered "yes" when asked "Do you have a television in your dorm room?". 11) ____________

Use critical thinking to develop an alternative conclusion.

12) A study shows that adults who work at their desk all day weigh more than those who do not. Conclusion: Desk jobs cause people to gain weight. 12) ____________
13) In a study of headache patients, every one of the study subjects with a headache was found
to be improved after taking a week off of work. Conclusion: Taking time off work cures
headaches.

Use critical thinking to address the key issue.

14) A questionnaire is sent to 10,000 persons. 5,000 responded to the questionnaire. 3,000 of the
respondents say that they "love chocolate ice cream". We conclude that 60% of people love
chocolate ice cream. What is wrong with this survey?

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

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a
percent, if necessary.

15) Convert 0.625 to an equivalent fraction and percentage.
   A) \(\frac{1}{2}, 62.5\%\)   B) \(\frac{5}{8}, 62.5\%\)   C) \(\frac{5}{8}, 6.25\%\)   D) \(\frac{1}{2}, 6.25\%\)

16) Convert 47% to an equivalent fraction and decimal.
   A) \(\frac{23}{50}, 4.7\)   B) \(\frac{23}{50}, 0.47\)   C) \(\frac{47}{100}, 0.47\)   D) \(\frac{47}{100}, 4.7\)

Solve the problem.

17) On a test, Shoshana got 86% or 215 of the items correct. How many items were on the test?
   A) 40   B) 43   C) 86   D) 250

Is the study experimental or observational?

18) A stock analyst observes the relationship between stock prices and earnings per share to help him
    select a stock for investment.
    A) Observational   B) Experimental

19) A clinic gives a drug to a group of ten patients and a placebo to another group of ten patients to
    find out if the drug has an effect on the patients’ illness.
    A) Experimental   B) Observational

Identify the type of observational study.

20) A town obtains current employment data by polling 10,000 of its citizens this month.
    A) Prospective   B) Cross-sectional   C) Retrospective   D) None of these

21) Researchers collect data by interviewing athletes who have won Olympic gold medals from 1980 to
    A) Retrospective   B) Cross-sectional   C) Prospective   D) None of these

22) A statistical analyst obtains data about ankle injuries by examining a hospital’s records from the
    past 3 years.
    A) Prospective   B) Retrospective   C) Cross-sectional   D) None of these
Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

23) A researcher interviews 19 work colleagues who work in his building.
   A) Convenience
   B) Stratified
   C) Random
   D) Systematic
   E) Cluster

24) A pollster uses a computer to generate 500 random numbers, then interviews the voters corresponding to those numbers.
   A) Stratified
   B) Random
   C) Cluster
   D) Convenience
   E) Systematic

25) A market researcher selects 500 people from each of 10 cities.
   A) Systematic
   B) Random
   C) Stratified
   D) Convenience
   E) Cluster

26) A sample consists of every 49th student from a group of 496 students.
   A) Convenience
   B) Cluster
   C) Stratified
   D) Random
   E) Systematic

27) The name of each contestant is written on a separate card, the cards are placed in a bag, and three names are picked from the bag.
   A) Systematic
   B) Stratified
   C) Random
   D) Convenience
   E) Cluster
Solve the problem.

28) Using the employment information in the table on Alpha Corporation, find the class midpoint for class 1-5.

Years employed at Alpha Corporation

<table>
<thead>
<tr>
<th>Class Limits (years of service)</th>
<th>Frequency (No. of employees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>5</td>
</tr>
<tr>
<td>6 - 10</td>
<td>20</td>
</tr>
<tr>
<td>11 - 15</td>
<td>25</td>
</tr>
<tr>
<td>16 - 20</td>
<td>10</td>
</tr>
<tr>
<td>21 - 25</td>
<td>5</td>
</tr>
<tr>
<td>26 - 30</td>
<td>3</td>
</tr>
</tbody>
</table>

A) 3.5  B) 3.0  C) 2.5  D) 5.0

29) Using the information in the table on home sale prices in the city of Summerhill for the month of June, find the class midpoint for class 235.0-265.9.

Class Limits (Sale price in thousands) | Frequency (No. of homes sold)
---------------------------------------|-------------------------------|
| 80.0 - 110.9                          | 2                             |
| 111.0 - 141.9                         | 5                             |
| 142.0 - 172.9                         | 7                             |
| 173.0 - 203.9                         | 10                            |
| 204.0 - 234.9                         | 3                             |
| 235.0 - 265.9                         | 1                             |

A) 250.55  B) 250.40  C) 250.50  D) 250.45

30) Using the employment information in the table on Alpha Corporation, determine the width of each class.

Years employed at Alpha Corporation

<table>
<thead>
<tr>
<th>Class Limits (years of service)</th>
<th>Frequency (No. of employees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>5</td>
</tr>
<tr>
<td>6 - 10</td>
<td>20</td>
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<tr>
<td>11 - 15</td>
<td>25</td>
</tr>
<tr>
<td>16 - 20</td>
<td>10</td>
</tr>
<tr>
<td>21 - 25</td>
<td>5</td>
</tr>
<tr>
<td>26 - 30</td>
<td>3</td>
</tr>
</tbody>
</table>

A) 10  B) 6  C) 4  D) 5
Construct the relative frequency distribution that corresponds to the given frequency distribution.  

<table>
<thead>
<tr>
<th>Incomes</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>200-300</td>
<td>65</td>
</tr>
<tr>
<td>301-400</td>
<td>62</td>
</tr>
<tr>
<td>401-500</td>
<td>70</td>
</tr>
<tr>
<td>501-600</td>
<td>71</td>
</tr>
<tr>
<td>&gt;600</td>
<td>14</td>
</tr>
</tbody>
</table>

A) | Relative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>200-300</td>
<td>15.5%</td>
</tr>
<tr>
<td>301-400</td>
<td>22.1%</td>
</tr>
<tr>
<td>401-500</td>
<td>31.3%</td>
</tr>
<tr>
<td>501-600</td>
<td>16.2%</td>
</tr>
<tr>
<td>&gt;600</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

B) | Relative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>200-300</td>
<td>24.39%</td>
</tr>
<tr>
<td>301-400</td>
<td>25.45%</td>
</tr>
<tr>
<td>401-500</td>
<td>5.00%</td>
</tr>
<tr>
<td>501-600</td>
<td>22.73%</td>
</tr>
<tr>
<td>&gt;600</td>
<td>24.48%</td>
</tr>
</tbody>
</table>

C) | Incomes  | Relative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>200-300</td>
<td>23.05%</td>
<td></td>
</tr>
<tr>
<td>301-400</td>
<td>21.99%</td>
<td></td>
</tr>
<tr>
<td>401-500</td>
<td>24.82%</td>
<td></td>
</tr>
<tr>
<td>501-600</td>
<td>25.18%</td>
<td></td>
</tr>
<tr>
<td>&gt;600</td>
<td>4.96%</td>
<td></td>
</tr>
</tbody>
</table>

D) | Relative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>200-300</td>
<td>12.5%</td>
</tr>
<tr>
<td>301-400</td>
<td>20.1%</td>
</tr>
<tr>
<td>401-500</td>
<td>37.3%</td>
</tr>
<tr>
<td>501-600</td>
<td>15.2%</td>
</tr>
<tr>
<td>&gt;600</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

Construct the cumulative frequency distribution that corresponds to the given frequency distribution.  

<table>
<thead>
<tr>
<th>Days of vacation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>20</td>
</tr>
<tr>
<td>5 - 9</td>
<td>21</td>
</tr>
<tr>
<td>10 - 14</td>
<td>13</td>
</tr>
<tr>
<td>15 - 19</td>
<td>22</td>
</tr>
<tr>
<td>20 - 24</td>
<td>24</td>
</tr>
</tbody>
</table>

A) | Days of vacation | Cumulative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>20</td>
</tr>
<tr>
<td>5 - 9</td>
<td>41</td>
</tr>
<tr>
<td>10 - 14</td>
<td>55</td>
</tr>
<tr>
<td>15 - 19</td>
<td>77</td>
</tr>
<tr>
<td>20 - 24</td>
<td>100</td>
</tr>
</tbody>
</table>

B) | Days of vacation | Cumulative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>20</td>
</tr>
<tr>
<td>5 - 9</td>
<td>41</td>
</tr>
<tr>
<td>10 - 14</td>
<td>54</td>
</tr>
<tr>
<td>15 - 19</td>
<td>76</td>
</tr>
<tr>
<td>20 - 24</td>
<td>100</td>
</tr>
</tbody>
</table>

C) | Days of vacation | Cumulative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>0.2</td>
</tr>
<tr>
<td>5 - 9</td>
<td>0.21</td>
</tr>
<tr>
<td>10 - 14</td>
<td>0.13</td>
</tr>
<tr>
<td>15 - 19</td>
<td>0.22</td>
</tr>
<tr>
<td>20 - 24</td>
<td>0.24</td>
</tr>
</tbody>
</table>

D) | Days of vacation | Cumulative Frequency |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>0.2</td>
</tr>
<tr>
<td>5 - 9</td>
<td>0.21</td>
</tr>
<tr>
<td>10 - 14</td>
<td>0.13</td>
</tr>
<tr>
<td>15 - 19</td>
<td>0.22</td>
</tr>
<tr>
<td>20 - 24</td>
<td>0.24</td>
</tr>
</tbody>
</table>
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use the given data to construct a frequency distribution.

33) On a math test, the scores of 24 students were

95 76 74 68 74 74 95 83 74 67 81 76
76 81 74 76 81 74 76 83 76 81 83 68

Construct a frequency table. Use 4 classes beginning with a lower class limit of 60.

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
</table>

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

Use the circle graph to solve the problem.

34) A survey of the 2294 vehicles on the campus of State University yielded the following circle graph.

- Motorcycles: 8%
- Convertibles: 17%
- Vans: 8%
- Sedans: 7%
- Hatchbacks: 36%
- Pickups: 24%

Find the number of pickups. Round your result to the nearest whole number.

A) 24  B) 551  C) 1743  D) 665
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

35) In a survey, 20 people were asked how many magazines they had purchased during the previous year. The results are shown below. Construct a histogram to represent the data. Use 4 classes with a class width of 10, and begin with a lower class limit of -0.5. What is the approximate amount at the center?

\[
\begin{array}{cccccccc}
6 & 15 & 3 & 36 & 25 & 18 & 18 & 5 & 30 \\
24 & 7 & 0 & 22 & 33 & 24 & 19 & 4 & 12 & 9
\end{array}
\]

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

Find the original data from the stem-and-leaf plot.

36) 

\[
\begin{array}{c|c}
\text{Stem} & \text{Leaves} \\
8 & 8 \ 6 \\
9 & 1 \ 8 \\
10 & 6 \ 6 \\
\end{array}
\]

A) 86, 88, 91, 98, 106, 106  
B) 86, 81, 88, 91, 101, 106  
C) 86, 88, 91, 91, 106, 106  
D) 81, 86, 81, 98, 108, 106

Construct the dot plot for the given data.

37) A store manager counts the number of customers who make a purchase in his store each day. The data are as follows.

9 10 7 13 6 9 9 10 7 6

\[
\begin{array}{c}
4 \ 9 \ 14
\end{array}
\]

\[
\begin{array}{c|c}
4 & 10 \ 3 \ 8 \\
9 & 1 \ 6 \ 9 \ 14 \\
14 & 1 \ 2 \ 3 \\
\end{array}
\]

A) 4) 9) 14)  
B) 4) 9) 14)  
C) 4) 9) 14)  
D) 4) 9) 14)
Use the data to plot a stem-and-leaf diagram.

38) The following data consists of the weights (in pounds) of 15 randomly selected women and the weights of 15 randomly selected men. Construct a back-to-back stem-and-leaf plot for the data.

Women: 128 150 118 166 142
122 137 110 175 152
145 126 139 111 170

Men: 140 153 199 186 169
136 176 162 196 155
173 190 141 166 153

Construct a pie chart representing the given data set.

39) After reviewing a movie, 600 people rated the movie as excellent, good, or fair. The following data give the rating distribution.

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>300</td>
<td>180</td>
</tr>
</tbody>
</table>

A) ![Pie chart](image)

B) ![Pie chart](image)
1) A
2) A
3) B
4) A
5) C
6) A
7) B
8) C
9) C
10) Sample: the 3 selected customers; population: all customers; not representative
11) Sample: the 50,000 selected college students; population: all college students; representative
12) Desk job workers are confined to their chairs for most of their work day. Other jobs require standing or walking around which burns calories. It is probably the lack of exercise that causes higher weights, not the desk job itself. Avoid causality altogether by saying lack of walking and exercise is associated with higher weights.
13) Headaches generally last for only a few hours, so anything would seem like a cure. There is no evidence to suggest that taking time off work will cure a headache.
14) This is not a random sample. The survey is based on voluntary, self-selected responses and therefore has serious potential for bias.

15) B
16) C
17) D
18) B
19) A
20) B
21) A
22) B
23) A
24) B
25) E
26) E
27) C
28) B
29) D
30) D
31) C
32) B
33) B

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 - 69</td>
<td>3</td>
</tr>
<tr>
<td>70 - 79</td>
<td>12</td>
</tr>
<tr>
<td>80 - 89</td>
<td>7</td>
</tr>
<tr>
<td>90 - 99</td>
<td>2</td>
</tr>
</tbody>
</table>

34) B
35) The approximate amount at the center is 16 magazines.

36) A
37) B
38) A
39) B