Your name: _______________________________

- Please show your work clearly.
- Points are assigned for the answer and the work shown.
- Please box your final answer.

(4pts) 1. Which of the following correctly describes the relationship between a sample and a population?
   a. A population and a sample are not related.
   b. A population is a group of samples that may or may not be included in a study.
   c. A sample is a group of populations that are subject to observation.
   d. A sample is a group of subjects selected from a population to be studied.

(4pts) 2. If a researcher manipulates one of the variables and tries to determine how the manipulation influences other variables, the researcher is conducting a(n)
   a. manipulative study
   b. experimental study
   c. independent study
   d. observation study

(4pts) 3. The amount of time needed to run the Boston marathon is an example of which type of variable?
   a. qualitative
   b. discrete
   c. continuous
   d. none of the above

(4pts) 4. Complete the following statements.
   Two major branches of statistics are ____________ and ____________.

(8pts) 5. True or False?
   a. The degree measure of the sectors (interior angles) of a pie chart can be obtained by multiplying the sector’s relative frequency proportion by 180°
   b. A stem-and-leaf display provides insight into the shape of the distribution of a set of data.
   c. The variable favorite color is an example of a qualitative variable.
   d. The weight of packages is considered to be a discrete variable.
6. Consider the following stem-and-leaf plot with a missing leaf indicated by $x$. If it is known that the sum of the data equals 322, what is the value for $x$.

<table>
<thead>
<tr>
<th>Stem (tens)</th>
<th>Leaves (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1 $x$</td>
</tr>
<tr>
<td>3</td>
<td>4 5 5 7</td>
</tr>
<tr>
<td>4</td>
<td>2 3 8</td>
</tr>
</tbody>
</table>

(4pts) 6. Consider the following stem-and-leaf plot with a missing leaf indicated by $x$. If it is known that the sum of the data equals 322, what is the value for $x$.

7. Classify the following sample as random, systematic, stratified, or cluster.
   “Every seventh customer entering a shopping mall is asked to select her or his favorite store.”

(4pts) 7. Classify the following sample as random, systematic, stratified, or cluster.
   “Every seventh customer entering a shopping mall is asked to select her or his favorite store.”

8. Classify the following as nominal-level, ordinal-level, interval-level, or ratio-level measurement.
   a. Temperature
   b. Age
   c. Letter grade
   d. Hair color

(8pts) 8. Classify the following as nominal-level, ordinal-level, interval-level, or ratio-level measurement.
   a. Temperature
   b. Age
   c. Letter grade
   d. Hair color

9. The following information shows the colors of cars preferred by customers.
   a. Complete the columns in the table below.

<table>
<thead>
<tr>
<th>Classes Colors</th>
<th>Frequency</th>
<th>Relative Frequency</th>
<th>Relative Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>80</td>
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<tr>
<td>White</td>
<td>50</td>
<td></td>
<td></td>
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<tr>
<td>Green</td>
<td>20</td>
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<td></td>
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<tr>
<td>Total</td>
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</tbody>
</table>

b. Create a Pareto chart using the above frequency.

c. Create a Pie graph.
(15pts) 10. The data shown below represent the height, in inches, of 20 different herbs. Construct a grouped frequency distribution with 4 classes by computing each column in the table.

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</tbody>
</table>

<table>
<thead>
<tr>
<th>Classes</th>
<th>Class Boundaries</th>
<th>Class Midpoint</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
<th>Relative Frequency</th>
<th>Cumulative Relative Frequency</th>
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</table>

Total: |

(15pts) 11. Use the data in problem 10 above to construct the following graphs:

a. Histogram

b. Frequency polygon

c. Ogive
12. The test scores on a 100-point test were recorded for 20 students

94  89  67  62  72  87  68  65  75  84
61  93  91  86  55  63  86  82  76  57

Construct an ordered stem-and-leaf plot

13. Determine which histograms have symmetric, skewed left, or skewed right distributions.

a)  

(5pts)

b)  

(5pts)

c)  

(5pts)

14. What is Statistics?