

Q1. (7 points) Answer the following questions by indicating it as True or False.

1. (**F**) In statistical terms, a population is defined as all the people that live in a particular region of the country.
2. (**F**) A phone service provider has 14,000 customers. Recently, the sales department selected a random sample of 400 customer accounts and recorded the number of minutes of long distance time used during the previous month. The data for this variable is considered to be nominal since the values are based on sample data.
3. (**F**) A survey conducted by a local real estate agency asked respondents to indicate whether they preferred natural gas, electric, or oil furnaces for heating their home. The data collected for this variable would be of ordinal level.
4. (**F**) One of the most effective methods for displaying the trend in the number of traffic accidents over the past ten years is to use a scatter plot showing the number of vehicles on one axis and the number of accidents on the second axis.
5. (**T**) A study at some University involved an analysis of students' GPAs and the number of hours that they work at jobs off-campus. An appropriate graph to display the relationship between these two variables might be a scatter diagram.
6. (**F**) In a recent study at Al-Riyadh Bank, a frequency count was made for the variable: marital status (1=Single, 2=Married, 3=Divorced, 4=Widowed, & 5=Other), for the bank's 10,000 customers. It would also be appropriate to develop a histogram for this variable to show how marital status is distributed.
7. (**F**) A value computed from a statistical sample is called a statistic, while a value computed from a non-statistical sample is referred to as a parameter.

Q2. (9 Points) Answer the following questions by choosing the right answer.

1. When a manager of a certain market prepares a series of charts and graphs to all people who invested in that market during the past five years, he is using which general category and statistical analysis?
 - a. Quantitative statistics.
 - b. Categorical statistics.
 - c. Inferential statistics.
 - d. **Descriptive statistics.**
 - e. None of the above.

2. If a manager wishes to analyze the number of units sold according to different prices, possibly the most effective type of graph will be:
 - a. A Pareto Chart.
 - b. A pie chart.
 - c. **A scatter diagram.**
 - d. A line chart.
 - e. None of the above.

3. A bar chart is most likely used to display which of the following?
 - a. A continuous variable.
 - b. A ratio level variable.
 - c. An ordinal level variable.
 - d. **Either b or c.**
 - e. None of the above.

4. When the park ranger at Al-Rashed Mall Park reports the average length of time that visitors spend in the park, he is using:
 - a. Graphical tools.
 - b. **Numerical measures.**
 - c. Statistical charts.
 - d. Histograms or bar charts.
 - e. None of the above.

5. When an accounting auditor randomly selects 20 accounts from all the accounts to check for accuracy, he has selected:
 - a. a personal observation.
 - b. **a sample from the population.**
 - c. a census.
 - d. a convenience sample.
 - e. None of the above.

6. A food warehouse manager plans to conduct a check on damaged packages. The warehouse covers a large area and products are spread out over the entire building. Assuming that no products are more likely to have damaged packages than any other, what statistical sampling method would be used to reduce the time and effort for the study?
 - a. Convenience sampling.
 - b. Stratified random sampling.
 - c. Cluster random sampling.
 - d. Systematic random sampling.
 - e. None of the above.

7. General Electric Corporation tracks employee turnover annually. They currently have a data set that contains turnover for the past 20 years. What type of data do they have?
 - a. Time series data.
 - b. Cross-sectional data.
 - c. Nominal data.
 - d. Ordinal data.
 - e. None of the above.

8. The human resources department at a major high tech company recently conducted an employee satisfaction survey of 100 of its 3,000 employees. Data were collected on such variables as age, gender, marital status, current salary, level of overall satisfaction on a scale from 1 to 5, number of years with the company, and job title. Consider only the variable: overall satisfaction. Which of the following best describes the level of data measurement for this variable?
 - a. Ratio level.
 - b. Interval level.
 - c. Ordinal level.
 - d. Nominal level.
 - e. None of the above.

9. Weekly stock closing prices for IBM would be classified as which of the following?
 - a. Cross-sectional data.
 - b. Simple random sample.
 - c. Nominal data.
 - d. Ordinal data.
 - e. None of the above.

Q3. (6+6 Points)

Given that the following are some quiz grades for the 110 students of STAT 211 in the first semester.

1.3	5.3	4.8	4.4	2.1	5.3	5.8	3.2	9.7	8.7
9.2	9.1	8.7	5.8	2.5	6.5	5.1	6.8	7.4	9.7
7.2	8.7	9.2	3.5	3.8	8.6	7.9	5.8	8.3	7.4
2.1	2.5	9.3	1.7	3.2	7.7	8.0	8.7	1.5	5.6
7.8	5.4	7.8	9.8	7.2	6.2	7.2	5.3	4.7	6.6
7.9	9.4	8.5	4.4	7.7	5.8	1.1	5.0	2.1	4.8
2.5	0.9	9.1	6.4	6.6	5.0	3.8	1.0	3.9	9.8
4.4	9.5	4.2	0.9	7.1	9.6	2.1	3.6	5.2	8.1
5.7	7.1	7.4	3.6	2.8	6.6	2.5	2.8	2.1	1.1
6.6	8.8	4.9	5.8	2.6	5.5	3.1	7.9	5.9	1.2
5.1	4.4	3.6	7.1	7.7	1.7	1.1	9.9	1.7	0.9

Starting from the upper left corner, moving row by row, and using the part of the random number table given below;

1	0	5	2	9	8	0	0	6	8	0	1	1	9	0	3	7	9	9	9	4	0	5	8	8	9	7	2	4	0	8	4	5
8	9	5	3	5	2	6	6	6	2	9	2	7	4	8	8	2	6	3	0	1	1	8	9	9	8	3	8	6	8	4	8	6
4	5	0	0	5	3	2	9	3	3	3	8	4	7	1	1	0	5	6	9	3	1	6	1	4	0	5	3	0	9	3	7	3
6	9	1	2	3	3	1	7	5	8	9	4	2	2	6	3	2	8	8	0	4	8	9	2	7	0	4	0	0	6	7	1	9
1	8	6	0	2	3	6	2	8	5	8	5	4	0	1	2	5	4	1	0	6	3	3	7	7	1	9	9	8	4	8	9	2
2	4	1	2	1	2	8	4	3	2	5	1	5	1	7	2	8	7	8	7	6	4	1	6	4	0	9	0	2	1	9	0	8
5	5	1	8	5	1	5	5	5	0	2	8	5	5	8	3	3	1	1	9	6	6	6	7	0	9	2	7	9	1	3	4	0
9	2	9	2	9	3	3	9	6	9	2	5	2	0	1	6	5	4	4	5	5	2	3	3	8	2	8	9	5	8	2	1	2
8	5	7	5	5	2	5	8	9	2	4	9	7	8	8	5	9	0	4	9	7	7	1	6	1	1	8	4	7	7	2	3	7
6	7	8	4	7	6	9	8	2	8	2	3	6	6	8	4	6	1	2	0	7	2	4	8	4	2	4	0	0	3	4	1	6

Answer the following:

a. Draw a simple random sample of size 6 from the grades with replacement.

105

006

058

053

105

006

1.7	5.8	2.1	4.4	1.7	5.8
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b. Draw a simple random sample of size 6 from the grades without replacement.

105

006

058

053

023

106

1.7	5.8	2.1	4.4	3.5	1.1
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Q4. (12+4+3+4+3 Points)

The following data represent a sample of weights (in kilograms) of 30 packages to be sent by some express mail agency in the country;

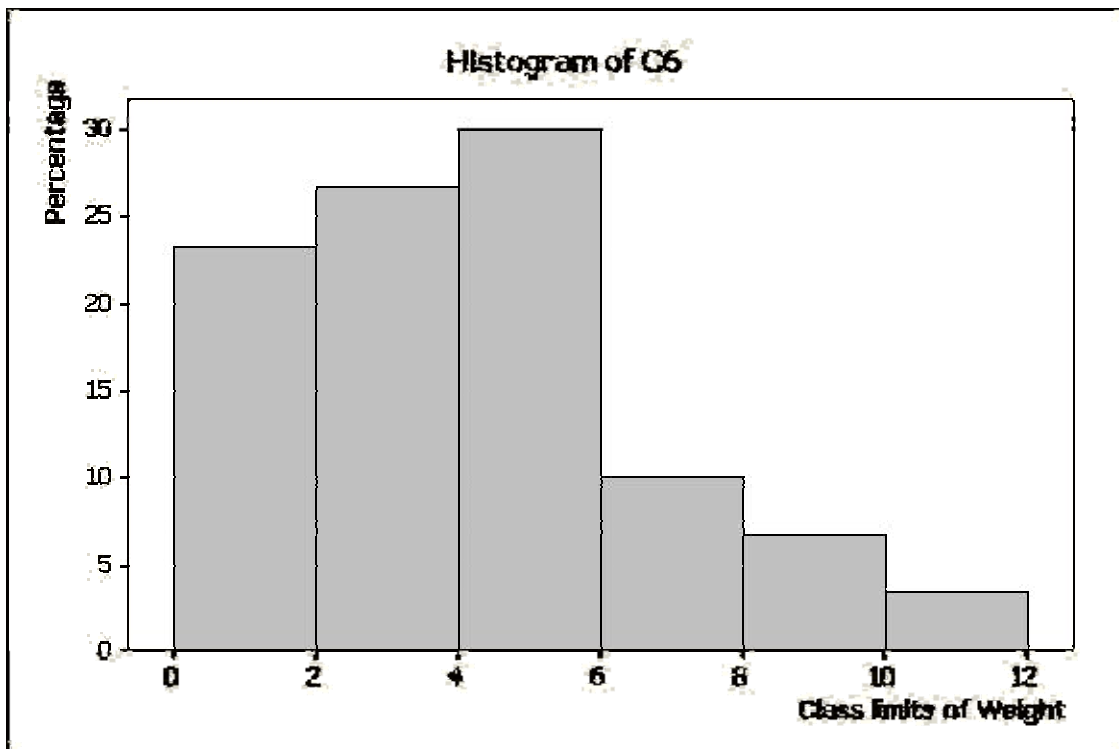
0.4 0.7 1.0 1.1 1.2 1.9 1.9 2.1 2.2 2.4
 2.7 2.8 3.1 3.4 3.5 4.0 4.5 4.6 4.9 5.0
 5.2 5.2 5.5 5.9 6.2 6.5 6.5 8.3 9.4 11.5

Given that the weights are already sorted for you, answer the following:

- a. Construct a grouped cumulative relative frequency distribution for the weights using 6 classes exactly and starting from 0.

i	Class	x_i	f_i	rf_i	F_i	rF_i
1	[0 , 2)	1	7	$7/30 = .233$	7	0.233
2	[2 , 4)	3	8	$8/30 = .267$	15	0.500
3	[4 , 6)	5	9	$9/30 = .300$	24	0.800
4	[6 , 8)	7	3	$3/30 = .100$	27	0.900
5	[8 , 10)	9	2	$2/30 = .067$	29	0.967
6	[10 , 12)	11	1	$1/30 = .033$	30	1.000
			30	1		

- b. Construct relative frequency histogram for the weights using 6 classes exactly.



- c. Write a comment about the histogram shape.

The graph has one APPROXIMATE mode at 5 and skewed to the RIGHT.

- d. Construct a stem-and-leaf diagram for the weights.

Stem	Leaf
0.	4 7
1.	0 1 2 9 9
2.	1 2 4 7 8
3.	1 4 5
4.	0 5 6 9
5.	0 2 2 5 9
6.	2 5 5
7.	
8.	3
9.	4
10.	
11.	5

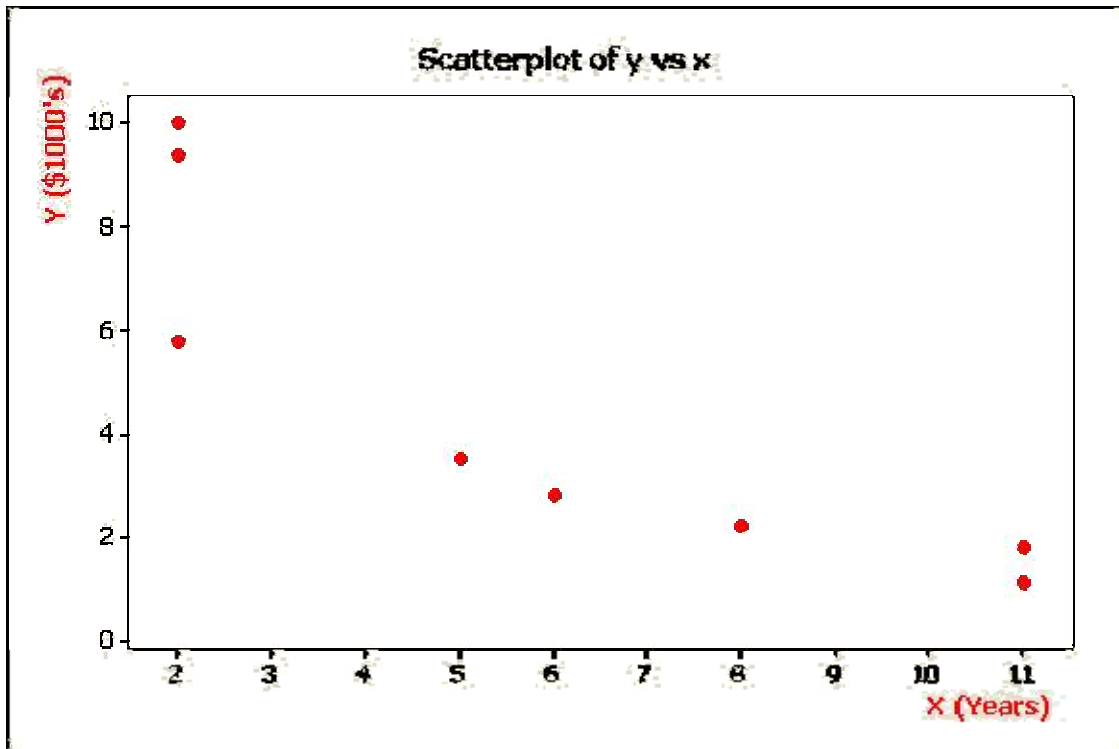
- e. Write a comment about the shape of the stem-and-leaf plot in (d).
1. The stem-and-leaf has **3 modes** as follows:
 - 1.9 has a frequency of 2
 - 5.2 has a frequency of 2
 - 6.5 has a frequency of 2
 2. It is skewed to the **right**.

Q5. (4+2 Points)

A daily newspaper lists the following used cars prices for a particular model Japanese car with age x in years and asking price y in thousands of dollars:

X	2	2	11	8	6	5	2	11
Y	10	5.8	1.8	2.2	2.8	3.5	9.4	1.1

- a. Construct a scatter plot for this data



- b. Describe the relation between the age x and the price y

There is an **inverse curvilinear** relationship between X & Y.

With My Best Wishes