Q1: Multiple choice questions: (24 Points)

1. A data set of 6 scores has a median of 21. If the highest score increases 3 points, the median will become
   a) 21
   b) 21.5
   c) 22.5
   d) 24
   e) none of these.

2. The population of this study is
   a) 3,423 men and 3,593 women selected from Minhang District
   b) All people at Minhang District
   c) All people of Shanghai
   d) All people of China
   e) 500,000 people near Shanghai

3. The sample in the study above is
   a) 3,423 men and 3,593 women selected from Minhang District
   b) the amount of cigarettes that the people of Minhang District buy.
   c) All people at Minhang District
   d) the 500,000 people near Shanghai
   e) All people of China

4. The mode is a measure of
   a) variability.
   b) dispersion.
   c) skewness.
   d) central tendency.
   e) symmetry.

Questions 2–3
The People’s Republic of China with its 1.2 billion people is considered as the world’s biggest cigarette market. To better understand Chinese smokers, door-to-door interviews of 3,423 men and 3,593 women were conducted in the Minhang District, a suburb of 500,000 people near Shanghai. The study concluded that “people of China are willing to spend an average of 60% of personal income to buy cigarettes.”

2. The population of this study is
   a) 3,423 men and 3,593 women selected from Minhang District
   b) All people at Minhang District
   c) All people of Shanghai
   d) All people of China
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4. The mode is a measure of
   a) variability.
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   c) skewness.
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   e) symmetry.

Questions 5–9
In order to estimate the number of cars owned per household in Kuwait, 30 households were randomly selected from the suburbs of Kaifan and Jabiiah. The numbers of cars owned by those households was determined. The following table

<table>
<thead>
<tr>
<th>Number of cars owned</th>
<th>Number of houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Answer the next 4 questions

5. The population of our study is
   a) all cars of the households of Kuwait.
   b) the households of Kuwait.
   c) the households of Kaifan and Jabiiah.
   d) all cars of the households of Kaifan and Jabiiah
   e) the people of Kuwait.

6. The sample of our study is
   a) all cars of the households of Kuwait.
   b) the households of Kuwait.
   c) the households of Kaifan and Jabiiah.
   d) all cars of the households of Kaifan and Jabiiah
   e) the people of Jabiiah and kaifan.
7. The median for the number of cars per household in the sample is
   a) 2
   b) 3
   c) 4
   d) 5.5
   e) 6

8. The mean for the number of cars per household in the sample is
   a) 2.0
   b) 2.33
   c) 2.63
   d) 6.0
   e) not an appropriate measure

9. The mode for the number of cars per household in the sample is
   a) 2
   b) 3
   c) 4
   d) 6
   e) 10

10. If you are told a population has a mean of 25 and a variance of 0, what must you conclude?
    a) Someone has made a mistake.
    b) There is only one element in the population.
    c) There are no elements in the population.
    d) All the elements in the population are 25.
    e) None of the above.

Questions 11–14
Out of all first-year students from the College of Business, 40 students were randomly selected and were asked which program they are going to select as their major. The following table shows the results of the survey:

<table>
<thead>
<tr>
<th>Major</th>
<th>freq.</th>
<th>Major</th>
<th>freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance</td>
<td>8</td>
<td>MIS</td>
<td>7</td>
</tr>
<tr>
<td>OPM</td>
<td>4</td>
<td>Accounting</td>
<td>7</td>
</tr>
<tr>
<td>Marketing</td>
<td>6</td>
<td>Economics</td>
<td>4</td>
</tr>
<tr>
<td>Management</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer the next 4 questions

11. If the table above is represented by a pie-chart, then the corresponding angle for the marketing major is
    a) 45°
    b) 54°
    c) 60°
    d) 66°
    e) 72°

12. The mode of the selected majors is
    a) 8.
    b) 7.
    c) 4.
    d) Economics, Marketing and OPM.
    e) Finance.

13. An appropriate measure of variability (dispersion) for the data above is
    a) the range.
    b) IQR.
    c) the standard deviation.
    d) the variance.
    e) not available.

14. The median of the selected majors is
    a) 4.
    b) 5.
    c) 6.
    d) Marketing.
    e) not an appropriate measure.
Q2: The following stem-and-leaf plot represents the monthly mobile phone bills (in KD) for a customer of Al-Watania, over the past 22 months.

<table>
<thead>
<tr>
<th></th>
<th>(unit = 0.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2 8</td>
</tr>
<tr>
<td>3</td>
<td>2 7 7 7 9</td>
</tr>
<tr>
<td>4</td>
<td>2 4 7 8</td>
</tr>
<tr>
<td>5</td>
<td>1 9</td>
</tr>
<tr>
<td>6</td>
<td>1 5 7 9</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>

(a) In what proportion of these months was the monthly phone bill greater than 70? (4 Points)

(b) What is the median monthly phone bill? (4 Points)

(c) Is this distribution skewed to the left, skewed to the right, or roughly symmetric? (4 Points)

(d) What is the mode of the monthly phone bills? (4 Points)
Q3: The following table gives the frequency distribution of the number of cars sold at Al-Sayer Toyota dealership in the past 30 days.

<table>
<thead>
<tr>
<th>Number of cars sold</th>
<th>Number of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>7</td>
</tr>
<tr>
<td>5–9</td>
<td>12</td>
</tr>
<tr>
<td>10–14</td>
<td>7</td>
</tr>
<tr>
<td>15–19</td>
<td>3</td>
</tr>
<tr>
<td>20–24</td>
<td>1</td>
</tr>
</tbody>
</table>

Use the above table (as needed) to answer the following:

(a) Calculate the mean of the number of cars sold daily ($\bar{x}$). (3 Points)

(b) Evaluate the variance of the number of cars sold daily ($s^2$). (4 Points)

(c) Evaluate the mode of the number of cars sold daily. (3 Points)

(d) Comment on the skewness of the distribution above. (2 Points)
Q4: The above figures shows (a) the total number of graduates at a certain institution between 1995 and 1999, and (b) the percentages of male and female graduates at these years. Based on the information in the figures above, answer the following questions by choosing the right answer:

1. The number of graduate students in 1999 was
   a) 600
   b) 750
   c) 800
   d) 900
   e) 1000

2. The number of male graduate students in 1995 was
   a) 600
   b) 750
   c) 800
   d) 900
   e) 1000

3. The period during which there was a drop in the number of graduates is
   a) 95 to 96
   b) 96 to 97
   c) 97 to 98
   d) 98 to 99
   e) none of the above

4. The percentage of females in the graduates of 1997 is
   a) 20%
   b) 30%
   c) 40%
   d) 50%
   e) none of the above

5. The difference in the number male graduates between 1997 and 1999 is
   a) 100
   b) 200
   c) 250
   d) 500
   e) 1000

6. In 1997, the difference between the number of male graduates and the number of female graduates was
   a) 0
   b) 200
   c) 500
   d) 750
   e) 1000
Q5: The following data gives the number of calls received for a sample of 12 hours at a taxi service company

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25  33  27  20  15  30  18  27  22  36  13  29
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(a) Determine the range. (2 Points)

(b) Determine the inter quartile range ($IQR$). (3 Points)

(c) Evaluate the standard deviation. (3 Points)

(d) Evaluate the mode. (2 Points)

(e) Calculate the upper inner fence (UIF) for the boxplot of the above data. (2 Points)