Instructions: 1. **WORK ALL PROBLEMS.** Please, give details and explanations and **SHOW ALL YOUR WORK** so that partial credits can be given.
2. You may use one page of notes and a calculator but no other reference materials.

---

**Points**

1. To give the administration an estimate of the total revenue which will be produced by Income taxes, the IRS commissioner took a random sample of 15 tax returns, in which the taxes paid were (in thousands of dollars):

   34, 2, 12, 39, 16, 7, 9, 63, 23, 15, 0, 19, 6, 12, 43

   (15) (a) Use the stem-and-leaf plot to compute the sample median.
   (10) (b) Compute sample mean, variance and standard deviation.

2. A certain electrical appliance is made up of three components. For the appliance to function properly, at least two of its components must function properly. If the components fail independently from one another, and if each has the probability of 0.20 of failing find:

   (8) (a) The probability that all components will fail.
   (8) (b) The probability that all components will function.
   (9) (c) The probability that the appliance will function properly.

3. The following probability table is a breakdown on age and race/ethnicity of sport reporters:

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>&lt;35</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>&gt;64</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>.24</td>
<td>.20</td>
<td>.16</td>
<td>.12</td>
<td>.03</td>
</tr>
<tr>
<td>Non-White</td>
<td>.07</td>
<td>.08</td>
<td>.07</td>
<td>.02</td>
<td>.01</td>
</tr>
</tbody>
</table>

Define the following three events:

A: One randomly selected reporter is white.
B: One randomly selected reporter is 35-44 years old.
C: One randomly selected reporter is less than 35 years old.

Find P(A), P(B), P(C), P(A or B), and P(A|C).

(25)

4. The unemployment rate in a city is 8.0%. A sample of five people from the labor force were drawn. Find the probability that the sample contains:

   (8) (a) Exactly four unemployed people.
   (10) (b) At least two unemployed people.
   (7) (c) Find the mean, variance and standard deviation of the number of unemployed people in the sample.