Name __________________________ Student ID _______________________

The exam is closed book. You may use a calculator, and one 8\(\frac{1}{2}\) by 11 sheet of paper with formulas (or anything else) on it, but no other notes. Put all of your work on this test form (use the back if necessary). Show your work or give an explanation of your answer. No credit for numbers with no indication of where they came from.

The points for the questions total to 100.

10 pts. 1. The following data are scores for 24 students on an exam.

\[\begin{array}{cccccccc}
74 & 94 & 72 & 87 & 76 & 57 \\
80 & 88 & 88 & 79 & 75 & 88 \\
64 & 82 & 73 & 87 & 88 & 86 \\
92 & 88 & 84 & 73 & 72 & 81 \\
\end{array}\]

Make a stem and leaf plot for these data using each stem twice, once for high leaves, once for low.

20 pts. 2. The following is a frequency distribution table for weight in ounces of a sample of 40 books from the library.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20— &lt;30</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>30— &lt;40</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>40— &lt;50</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>50— &lt;75</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>75— &lt;100</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>100— &lt;150</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
10 pts. 1. Fill in the relative frequency column of the table.

(b) Draw a histogram using these class intervals.

20 pts. 3. Describe the two kinds of data for which the median may be a better measure of center than the mean.

4. For the following data

\[
\begin{array}{cccccccc}
10.5 & 21.0 & 11.9 & 20.0 & 13.9 & 14.9 & 7.2 \\
20.6 & 10.2 & 12.9 & 7.6 & 7.5 & 5.2 \\
\end{array}
\]

(a) Calculate the sample median.

(b) Calculate the interquartile range (IQR).

(c) Calculate the 23.1% trimmed mean.

10 pts. 5. The amount of snowfall in December has mean 11.8 inches and standard deviation 2.2 inches and approximately follows a normal curve.

(a) Approximately what percentage of years will the snowfall be between 9.6 and 14.0 inches?

(b) Approximately what percentage of years will the snowfall be between 7.4 and 16.2 inches?

(c) Approximately what percentage of years will the snowfall be between 7.4 and 9.6 inches?

15 pts. 6. Suppose height and weight for a sample of 100 men have the following summary statistics

\[
\begin{align*}
\bar{x} &= 70 \\
\bar{y} &= 160 \\
s_x &= 3 \\
s_y &= 30 \\
r &= .5 \\
\end{align*}
\]

where height \((x)\) is measured in inches and weight \((y)\) is measured in pounds.

(a) Determine the equation of the least squares regression line of \(y\) on \(x\).

(b) Predict weight of a man 66 inches tall.
(c) What fraction of the variance of height is explained by the linear relationship between height and weight?

15 pts.  7. In a study of the relationship of speed $y$ in feet per second and stride rate $x$ in steps per second, the following summary quantities were obtained for $n = 11$ runners

$$\sum y = 205 \quad \sum y^2 = 3880$$
$$\sum x = 35 \quad \sum x^2 = 112$$
$$\sum xy = 660$$

(a) Determine the equation of the least squares regression line.

(b) Predict the speed for a runner with a stride rate of 3.5 strides per second.