There are 10 questions. Do all parts of all questions. Show the work you do to obtain an answer. A calculator and your textbook are allowed. No other books or notes are allowed. Make sure you have seen and understand the material in the syllabus about what sort of notes you are allowed to put in your book. Do not share calculators.

Put your name on your blue book. Put all the work you wish to have graded in your blue book. Turn in both your exam and your blue book together. When you turn in your exam make sure your name gets checked off the list as having turned in the exam.

1. (6 points) In each case tell whether the information given is at the nominal, ordinal, interval, or ratio level of measurement. The number or word in parentheses indicates what data you are to classify.
   (i) President Bush is a Republican (Republican)
   (ii) The term of office for a President is 4 years. (4)

2. (6 points) In each case tell whether the sample is being selected by random, systematic, cluster, stratified, or convenience sampling.
   (a) A marketing firm wishes to conduct a mail survey of the country. It randomly selects 50 different zip codes, then mails the survey to everyone in each zip code.
   (b) I wish to know how SU students feel about statistics so I ask a few people in this class.

3. (12 points) Men's weights are normally distributed with a mean of 172 pounds and a standard deviation of 29 pounds. We wish to design an elevator to safely carry 14 people. Find the maximum total allowable weight if we want a 95% probability that this maximum will not be exceeded when 14 men are randomly selected.

4. (12 points) Pumpkin weights are normally distributed with a mean of 21 pounds and a standard deviation of 3 pounds. If one pumpkin is chosen at random, what is the probability that its weight is between 19 and 23 pounds?
5. (12 points) Consider the following table, which describes the imaginary sinking of the imaginary boat the Miniscule.

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survived</td>
<td>21</td>
<td>13</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Died</td>
<td>11</td>
<td>16</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(a) If one of the Miniscule passengers is randomly selected, find the probability of getting a boy or someone who survived the sinking.
(b) If we randomly select someone who was aboard the Miniscule, what is the probability of getting a woman, given that the selected person died?

6. (10 points) A simple random sample of 26 medicine pills has a mean weight of 2.4 grams with a sample standard deviation of 0.3 grams. Find a 99% confidence interval for the standard deviation of the weights of all the pills. Assume pill weights are normally distributed.

7. (12 points) For the following list of data:
(a) Compute the 20th percentile.
(b) Compute the percentile of the data value 15.

5 7 9 10 11 12 14 15 17

8. (10 points) You wish to make a confidence interval for the proportion of people with red hair in a certain state. You want the confidence level to be 97% and the error to be 0.02. No prior estimate of the proportion is available. What should your sample size be?

9. (10 points) In a certain state 30% of the voters are Democrats.
(a) Find the mean and standard deviation for the number of Democrats in groups of 1000 voters from that state.
(b) If a group of 1000 voters from that state had 250 Democrats, would that be considered unusual? Why?

10. (10 points) Passwords are made according to the following rules. Each password has 4 characters. The first two are letters of the alphabet, repeats allowed. The last two are single digit numbers, 0 - 9, repeats allowed. How many different passwords are possible?