Syracuse University
Probability and Statistics for the Liberal Arts I
MAT121, Fall 2016

Name: __________________
SUID: __________________

Make up - Final Exam

I understood that this is a makeup final exam. It might be different from the final exam given in class. Please sign here: __________________________

******************************************************************************
• Write your full name.
• Your lecture notes are not allowed. You may use a calculator.
• Write clearly, and give sufficient details to justify your answers.
• The use of mobile phones or pagers is not allowed.
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Question 1: /06
Question 2: /14
Question 3: /10
Question 4: /12
Question 5: /08
Question 6: /10
Question 7: /10
Question 8: /10

TOTAL: /80
1. Construct a Leaf and Stem Plot of the following data:

1.1, 2.1, 1.1, 1.2, 3.5, 2.2, 3.5, 3.1, 3.7, 4.2, 4.1, 3.2, 6.7, 5.1, 6.2
2. Consider the following sample of data values:

\[ 10, 9, 7, 12, 11, 9, 12, 8, 13, 10. \]

(a) Find the mean, and sample standard deviation (You receive no credit if the answer is given without details).
(b) Find the z-scores of 12 and 8, and determine which value of 12 and 8 is usual or unusual.

(c) Find $P_{27}$.

(d) Find $P_{79}$. 
3. A survey shows that 80% of university students own laptops. If 8 university students are selected at random, find

(a) the probability that exactly 6 of them own laptops.

(b) the probability that at least 6 of them own laptops.
4. The length of life of an instrument produced by a machine has a normal distribution with a mean of 12.3 months and standard deviation of 2.2 months.

(a) Find the probability that an instrument produced by this machine will last more than 15.5 months.

(b) Find the probability that an instrument produced by this machine will last no more than 16.18 months.

(c) Find the length of life $T$ for which 78% of instruments produced by this machine will last less than $T$ months.
5. Based on a simple random sample, a 95% confidence interval for a population proportion is given by

\( (0.70, 0.76) \).

(a) Find the sample proportion \( \hat{p} \), and the margin of error \( E \).

(b) Find the necessary sample size \( n \) to obtain the above confidence interval.
6. A simple random sample of 34 pregnant women shows that the average length of their pregnancies has is 268 days with a standard deviation 15 days. Construct 98% confidence interval for the mean length of pregnancies of ALL pregnant women.
7. The table below classifies a group of voters according to gender and political affiliation.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Democrat</th>
<th>Republican</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>205</td>
<td>251</td>
<td>33</td>
</tr>
<tr>
<td>Female</td>
<td>269</td>
<td>182</td>
<td>57</td>
</tr>
</tbody>
</table>

(a) What is the total number of voters in this group?

(b) If a person is chosen at random from this group of voters, what is the probability of selecting a male or Republican voter.
8. An economist wants to estimate the mean income of the first year of the work for all college graduates. Preliminary studies suggests that the standard deviation of the income of the first year of the work for all college graduates is $660. How big a sample size she should take if she wants to construct a 95% confidence interval estimate of the mean first year income of the college graduates with a margin of error of $ 200?