Probability and Statistics for the Liberal Arts I MAT 121 Spring 2016

Final Exam

VERSION A

Statement of Ethics regarding this exam
I agree to complete this exam without unauthorized assistance from any person, materials, or device.
Signature: ___________________________ Date: 9 May 2016

DIRECTIONS, Read Carefully

• This is a 120 minutes exam.

• This exam consists of 5 questions. Total 65 Points. The exam will be graded over 80 points. Namely 10 points is extra credit.

• It is your responsibility to make sure that all 6 pages are present.

• The exam is open book. No extra papers are allowed. If you need extra paper your instructor will give you additional paper. Return the additional paper with your exam paper and write your name.

• Show your work to receive full credit. Just answers or irrelevant calculations does not receive any credit.

• Turn off your cell phone and any other wireless device or mute and leave them in your bag.

• Remember the ethics policy.

• Best Wishes!

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If you are using central limit theorem, then verify the requirements. Write Down every formula that you are using and write down every calculator command that you are using. Do not explain how you get the command. Write the command together with the entries such as `normalcdf(1,2)` etc..

**QUESTIONS**

1. (15 points) The seasonal snowfall totals in Syracuse, NY from the winter of 2005-06 through the winter of 2014-15 are given below in inches. Note that this data comes from a population. **If needed, round your answer to 2 decimal places.** Write the formula or the calculator command that you are using. If you use the same calculator command for different parts, then you need to write the command only once. If your calculator is not TI83 or TI84, then write your calculator brand and model together with your calculator command.

   124.6  140.2  109.1  149.6  106.2  179.4  50.6  115.4  132  119.7

   (a) What is the mean seasonal snowfall total?
   (b) What is the standard deviation?
   (c) What is the median?
   (d) What is the percentile of 140.2 in?
2. (15 points) YOU MUST SHOW ALL FORMULAS or CALCULATOR COMMANDS THAT YOU USE! A die is rolled 12 times and the number of times that "FIVE" shows on the upper face is counted.

(a) Find the probability of exactly 6 of them are FIVE’s. Round your answer to 4 decimal Places.

(b) Find the probability of at most 3 of them are FIVE’es. Round your answer to 4 decimal Places.
3. Write Down every formula that you are using and write down every calculator command you are using. Check the requirements if needed

A bank’s loan officer rates applicants for credit. The ratings are normally distributed with a mean of 700 and a standard deviation of 80.

(a) (5 points) If an applicant is randomly selected, find the probability that applicant’s rating is between 620 and 840. **Round to 4 decimal places**

(b) (10 points) If 16 applicants are randomly selected, find the probability of an average rating that is between 660 and 720. **Round to 4 decimal places**
4. (10 points) Write Down every formula that you are using and write down every calculator command you are using together with entries. Check the requirements if needed

Assume that the population has a normal distribution. A laboratory tested 14 randomly selected chicken eggs and found that the mean amount of cholesterol was 205 milligrams with standard deviation $s = 21$ milligrams. Construct a 99% confidence interval for the population mean ($\mu$) cholesterol content of all such eggs. **Round to 2 decimal places**
5. (10 points) **EXTRA CREDIT** Write Down every formula that you are using and write down every calculator command you are using. Check the requirements if needed

Assume that IQ scores are normally distributed. A simple random sample of 17 IQ scores is obtained. The subjects had a standard deviation IQ score of 14.9

Construct a 98% confidence interval estimate of $\sigma$, the standard deviation of the population from which the sample was obtained. Round your answer to 1 decimal place.