**Statistics 251: Lab 4 Handout**

First Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Last Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Please write down your answers neatly and do show your work (including R code). Please use proper notations in your solutions.**

Part 1

1. Calculate the cdf and pdf of the lifetime of System I.

Does the lifetime of System I follow an exponential distribution?

1. The probability that the system fails before 70 hours is \_\_\_\_\_\_\_\_\_\_\_.
2. Do a simulation. (Remember to show your R code.)
3. Draw a histogram of the sample with the pdf in Question 1 on top.

Does the probability density of the sample follow a similar pattern as the pdf?

1. Estimate the probability that the system fails before 70 hours using the samples. Is the result close to the true probability value?

Part 2

1. Calculate the cdf and pdf of the lifetime of System II.

Does the lifetime of System II follow an exponential distribution?

1. The probability that the system fails before 70 hours is \_\_\_\_\_\_\_\_\_\_\_.
2. Do a simulation. (Remember to show your R code.)
3. Draw a histogram of the sample with the pdf in Question 1 on top.

Does the probability density of the sample follow a similar pattern as the pdf?

1. Estimate the probability that the system fails before 70 hours using the samples. Is the result close to the true probability value?