Exam 2 guideline

You are expected to be able to do the following:

* Perform basic coding in R, or a programming language of your choice. You might be asked to create data, import data, create basic plots (like histogram), and find summary statistics (like mean, median, SD).
* Understand the idea of statistical inference.
* Appropriately use pnorm, dnorm, rnorm functions in R for calculating probability, evaluating density function, and random sampling (normal distribution is given as an example; you should also know other distributions that we’ve learned). You can use another program language as long as you can do these tasks.
* Fit parametric models (normal, lognormal, gamma, and weibull) to a given dataset:
  + get parameter estimates for a given model
  + calculate the log-likelihood of a model
  + use log-likelihood to compare models
  + overlay the model fitting curves on top of a histogram of the data to visually compare different models
  + recommended: review examples from Lecture 6 and Q1 of HW6
* Understand the idea of bootstrapping:
  + generate bootstrap confidence intervals for a parameter (like median, mean, or any percentile)
  + recommended: review examples from Lecture 7 and Q1 of HW7
* Understand the idea of Monte Carlo methods:
  + perform Monte Carlo integration
  + simulate the distribution of a test statistic under some given hypothesis (like we did in the lady tasting tea and coin flipping examples in Lecture 8)
  + recommended: review examples from Lecture 8 and Q2, 3, 4 of HW8.
* In addition, you are expected to be able to design and write code for simulation, which usually requires for loops.
  + some homework questions that involve this type of coding include: Q2, Q5 of HW1, Q4 of HW2, Q5 of HW3, Q5 of HW4