ECE-311 (ECE, NDSU)
Lab 7 – Simulation
Matlab-aided analysis

1. Objective

The objective of this simulation lab is to get more familiar with Matlab and utilize it in context of working with Laplace transforms. Matlab is a powerful numerical analysis tool, which can be utilized to find for example the inverse Laplace transform, or the solution of equations arising from the analysis of circuits with time-varying excitations, etc.

2. Preparation

To prepare for this lab read the following:
   a) Matlab tutorial from Appendix 5 from textbook.
   b) Matlab tutorial from UPenn (link is on the course webpage: http://www.dejazzer.com/ece311/lab_materials.html). Read only what is useful for this lab; however, going through all of it would not harm.
   c) Section on Computer-aided analysis from textbook pages 551-553.
   d) Section on Computer-aided analysis from textbook pages 578-580.
   e) Example from textbook pages 585-586.

3. Matlab-aided analysis

(1) In the computer cluster room, you will use Matlab to do part (d) of problems 38 and 40 (page 568) of Chapter 14 from the textbook. In your lab report, you must include your analytical calculations for parts (a)-(c) of problems 38 and 40. ***Note: even though these two problems are on hw assignment #4, you should still include copies of your analytical calculations for parts (a)-(c) in the lab report.***

(2) Use Matlab to find the inverse Laplace transforms of the s-domain functions from problem 45 (page 568) from textbook.

4. Lab report

(1) Write one or two paragraphs on Matlab and its usefulness in the context of circuit analysis.

(2) Provide the Matlab command-prompt output during its usage to solve part (d) of problems 38 and 40 and problem 45. Include also copies of your analytical calculations only for parts (a)-(c) of problems 38 and 40.