EGR 272 Due date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Circuit Theory II

File: N272M2A

**MATLAB Assignment #2 – AC Circuit Analysis**

In general most MATLAB assignment should include the following items:

* All required hand calculations
* All MATLAB programs
  + Write programs (.m files) – do not use the Command Window.
  + Be sure to begin with a block of comments including name, course number, assignment number, problem, and a brief description of the problem.
  + Include comments throughout each program. Use comments to indicate units for variables.
* All required MATLAB outputs (nicely formatted)
* Discussion of the results

1. **Circuit 1**: Note that this is the same problem used in PSPICE Assignment #2.

A) **Assigned circuit values:** Use values for Circuit 1 based on your Student ID as follows:

* Let C = last 3 non-zero digits of your Student ID in F
* Let L = first 3 non-zero digits of your Student ID in mH
* Let θ = last 2 non-zero digits of your Student ID in degrees
* Ex: For the ID 20345607, use C = 567 F, L = 234 mH, and θ = 67 degrees.
* Show how your determined your values.

1. **Hand Analysis:**

Analyze Circuit 1 by hand using phasor analysis. Determing the phasor values (in polar form) for I, VR1, VR2, VL, and VC. Show all details in the solution.

1. **MATLAB Analysis:**

* Write a MATLAB program to analyze Circuit 1. Use MATLAB to perform all calculations (for example, specify the values of w and C and let MATLAB calculate ZC rather than specifying ZC). Print the phasor values (magnitude and phase in degrees) for I, VR1, VR2, VL, and VC.

1. **Discussion:**

* Create a table comparing your hand results with the results from MATLAB (both magnitude and phase) for I, VR1, VR2, VL, and VC.
* Discuss the results.

2. **Circuit 2**:

A) Analyze textbook problem 9.65 by hand (this was a homework problem). Show all details of the solution.

B) Analyze the problem using MATLAB. Use MATLAB to perform all calculations. Print the phasor result (magnitude and phase in degrees).

C) Compare the discuss the results.

+ VR1 -

50

+ VR2 -

100

+

VL

\_

L

C

+

VC

\_

I

24sin(250t + θ) V

Circuit 1