Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (please print)

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ECE 2300 -- Exam #1

October 10, 2015

Keep this exam closed until you are told to begin.

1. This exam is closed book, closed notes. You may use one 8.5” x 11” crib sheet, or its equivalent.

2. Show all work on these pages. Show all work necessary to complete the problem. A solution without the appropriate work shown will receive no credit. A solution that is not given in a reasonable order will lose credit. Clearly indicate your answer (for example by enclosing it in a box).

3. It is assumed that your work will begin on the same page as the problem statement. If you choose to begin your work on another page, you must indicate this on the page with the problem statement, with a clear indication of where the work can be found. **If your work continues on to another page, indicate clearly where your work can be found. Failure to indicate this clearly will result in a loss of credit.**

4. Show all units in solutions, intermediate results, and figures. Units in the exam will be included between square brackets.

5. Do not use red ink. Do not use red pencil.

6. You will have 90 minutes to work on this exam.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/15

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/15

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/35

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/35

Total = 100

Room for extra work

1. {15 Points} Use the circuit given below to solve this problem. Find the equivalent resistance seen by the voltage source at terminals D and F, and the power delivered by the voltage source.



Room for extra work

2. {15 Points} Use the circuit given below to solve this problem. Find the equivalent resistance seen by the current source at terminals K and L, and the power absorbed by the current source.



# Room for extra work

3. {35 Points} Device A can be modeled as an ideal voltage source in series with a resistance of value 0.5[kΩ]. When Device A is connected to a current source of 3[mA], as shown in Figure 1, power delivered by this current source is 10.2[mW]. Device B can be modeled as an ideal current source in parallel with a resistance. Device B and its current-voltage characteristics are shown in Figure 2. Device A and Device B are connected together, as shown in Figure 3.

a) Find a model for Device A, showing terminals a and b.

b) Find a model for Device B, showing terminals c and d.

c) Find the power absorbed by Device B in Figure 3.

C:\Users\gaksu\Desktop\ECE2300 Fall2015 Exam 1\exam1_q2.emf

Room for extra work

4. {35 Points} Use the node-voltage method to write a complete set of equations that could be used to solve the circuit below. Define all variables. Do not attempt to simplify the circuit. Do not attempt to simplify or solve the equations.



Solution:



















