Student Name:

ENGR 2910: Circuits Analysis I **Final Exam**
Instructor: Leo Silbert Spring 2020

Answer all questions.

Type, write, or attach pictures of your worked solutions into this exam paper. Make sure your work is clear enough for grading.

Show all your work to receive full credit.

Underline each of your final answers with correct units.

Add extra pages as needed.

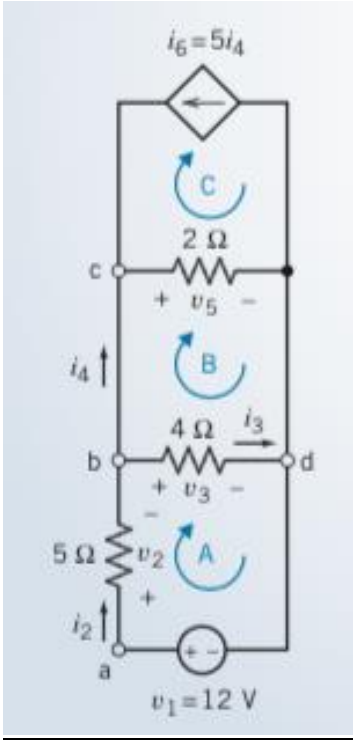
Upload your completed paper.

DEADLINE FOR SUBMISSION: 11:59pm, Wednesday, April 22, 2020.

Late papers will not be graded.

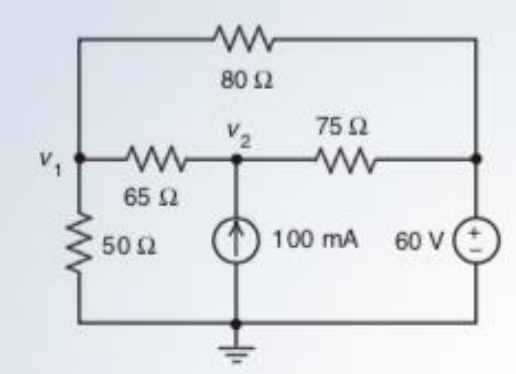
Question 1 [10 points]

Apply Kirchoff's Current and Voltage Laws, to compute the currents and voltages labelled in the following circuit. [For this question DO NOT use matrix solving software.]



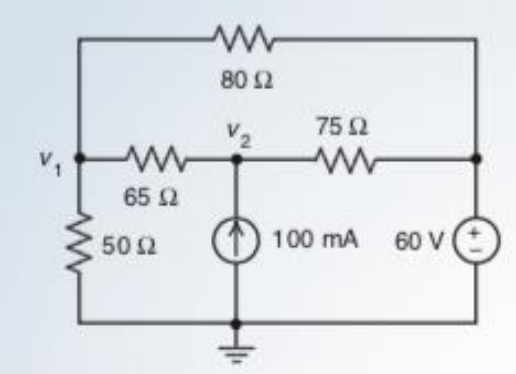
Question 2 [10 points]

Use the **node voltage** method to find the voltages v_1 and v_2 in the following circuit.



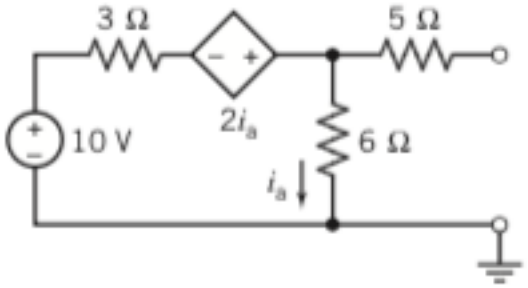
Question 3 [10 points]

Use the **mesh current** method to find the voltages v_1 and v_2 in the following circuit.



Question 4 [10 points]

Compute the short circuit current, the Thévenin resistance (using a voltage test source), and hence the Thévenin voltage for the circuit shown below.



Question 5 [10 points]

Consider the role of inductors and capacitors in regular circuits. Discuss, in your own words using concise substantive sentences, the properties of inductors and capacitors in the context of how they respond to changes in the circuit. Distinguish between the manner in which inductors and capacitors are capable providing energy to the circuit and/or how they can be used to stabilize circuit response. To assist you, you may want to perform an internet search to provide some explicit examples of the important uses of inductors and capacitors in actual electronic devices.