ECSE-200 Electric Circuit 1—Quiz #5 (Feb 15, 2019)

**LAST NAME** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **MCGILL ID#** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FIRST NAME­­­­­­­­­**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**SIGNATURE**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* ***Carefully read the questions***
* ***Show all your work***
* ***Clearly indicate your final answer***
* ***Plagiarism will have important consequences***
* ***Provide symbol for both the multiplier and SI unit in your final answer where applicable***
* ***Only standard calculator is accepted***
* ***You have 45 minutes to complete this quiz***

**Question 1:** Consider the Thévenin circuit below showing the voltage variable *vAB* at the output of the two terminals (A and B) and the current variable *iAB*. Answer the following questions.

1. Derive the equation relating the current variable *iAB* to the voltage variable *vAB*. [1 pt]
2. Draw the *iAB-vAB* diagram corresponding to the circuit shown. Have the voltage *vAB* on the x-axis and the current *iAB* on the y-axis. Clearly indicate the value of the voltage *vAB* when *iAB =* 0A, and the value of the current *iAB* when *vAB* = 0V. [2 pt]
3. What is the power delivered by the independent voltage source when a load resistor of 20 Ω is connected between the two terminals A and B? [2 pt]
4. Indicate on your diagram in part b), the *iAB-vAB* point corresponding to the circuit in part c) (i.e., when a load resistor of 20 Ω is connected). [1 pt]

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**Question 2:** Considering the circuit below. Answer the following questions.

1. Use source transformation to find the value of the current *ix*. [3 pt]
2. Use the principle of superposition to find the value of the power delivered by the independent voltage source. [3 pt]

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