VE215 2022Fall Assignment 2

Due Date: 23:59, October 23rd, 2022

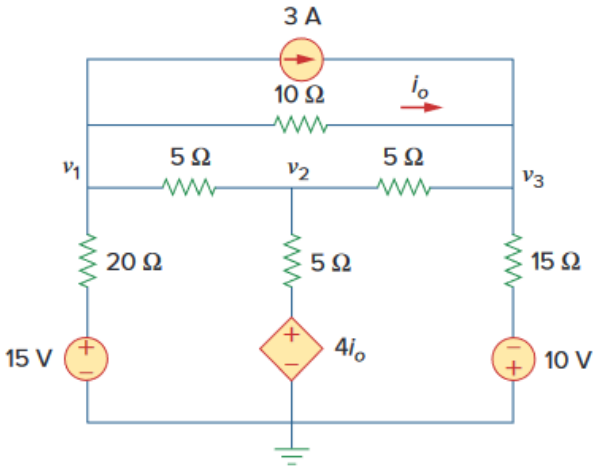
In order to get full marks, you shall write all the intermediate steps of calculation or proof unless otherwise indicated.

Exercise 2.1 (45%)

(a) (15%) Calculate v_1, v_2 and v_3 in the following circuit using Nodal Analysis.

(b) (15%) Calculate i_0 in the following circuit using Mesh Analysis.

(c) (15%) Verify your result of i_0 by applying Superposition rule.



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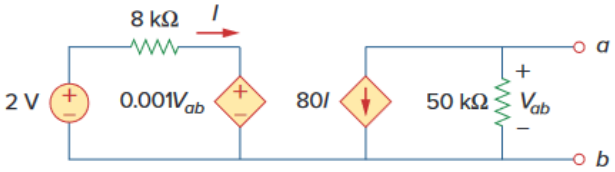
Exercise 2.2 (35%)
(a) (20%) Obtain the Thevenin and Norton equivalent circuit at the terminal a-b. Draw the circuit.
(b) (5%) Calculate the voltage V_{ab} if now a resistor of $10k\Omega$ connects between terminal a-b.
(c) (10%) Calculate the maximum power transferred to a resistor that connects between terminal a-b. Also calculate the resistance of that resistor.



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Exercise 2.3 (20%)
Calculate the maximum power that can be delivered to the variable resistor R in the following circuit. State your reasons.