

Name or ID: _____

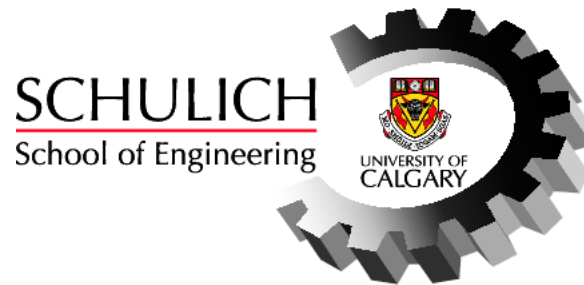
Lecture Section: _____

L01 - Pouyan (Yani) Jazayeri

L02 - Ed Nowicki

L03 - Fabio Ayres

L04 - Norm Bartley



ENGG 325 - Electric Circuits and Systems

Midterm Examination

Wednesday, October 24, 2007

Time: 6:30 - 8:00 PM

Instructions:

- Time allowed is 90 minutes.
 - The examination is closed-book.
 - Only calculators sanctioned by the Schulich School of Engineering are permitted in the examination.
 - The maximum number of marks is 50, as indicated; please attempt all questions. The midterm examination counts 25% toward the final grade.
 - Please use a pen or heavy pencil to ensure legibility.
 - Please answer questions in the spaces provided; if space is insufficient, please use the back of the pages.
 - Please show your work; where appropriate, marks will be awarded for proper and well-reasoned explanations.
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Name: _____, ID: _____

1. Consider the circuit in Fig. Q1.

- (a) Find all the node voltages. **[7 marks.]**
- (b) Find power in the dependent source and in the 10V source, specifying if power is supplied or absorbed. **[5 marks.]**

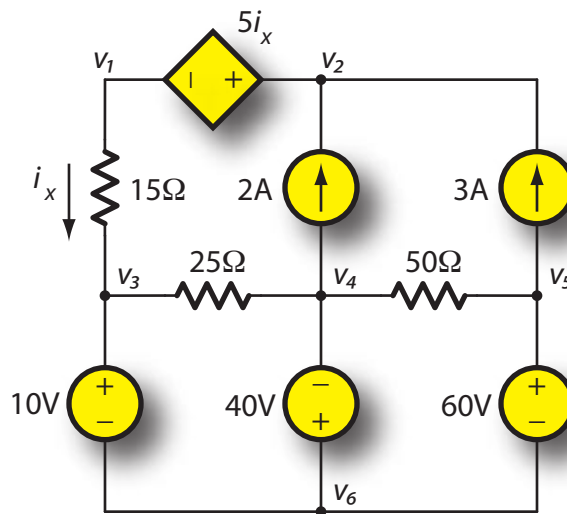


Fig. Q1. Find all node voltages, then power in dependent and 10V sources.

[12 marks total.]

(Question 1, additional workspace ...)

2. Consider the circuit given in Fig. Q2.

(a) Find all of the mesh currents.

[6 marks.]

(b) Using your answers to part (a), find all the node voltages.

[6 marks.]

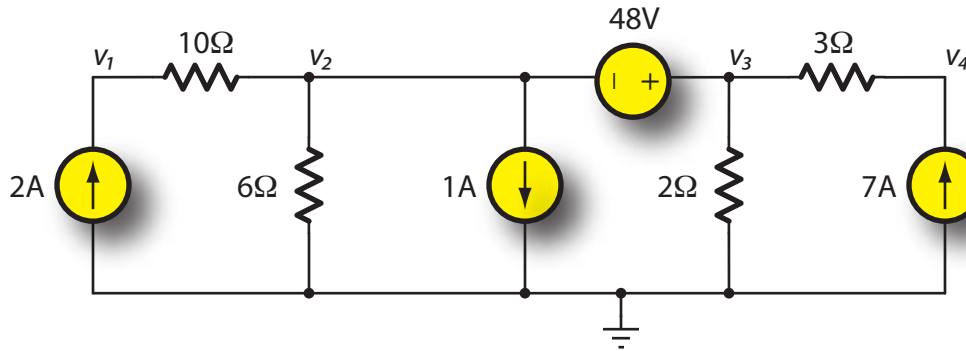


Fig. Q2. Find all of the mesh currents, then node voltages.

[12 marks total.]

(Question 2, additional workspace ...)

3. Consider the circuit shown in Fig. Q3.

- (a) Suppose that the voltage v_{ab} for the circuit shown has been accurately measured and found to be $v_{ab} = 20V$. Determine the Thévenin equivalent circuit at the terminals **a** and **b** for this circuit. **[10 marks.]**
- (b) Predict v_{ab} if a resistor R_{ab} is now placed across terminals **a** and **b**, where:
- i. $R_{ab} = 2.25\Omega$;
 - ii. $R_{ab} = 7.85\Omega$;
 - iii. $R_{ab} = 47\Omega$.
- [1 mark each.]**

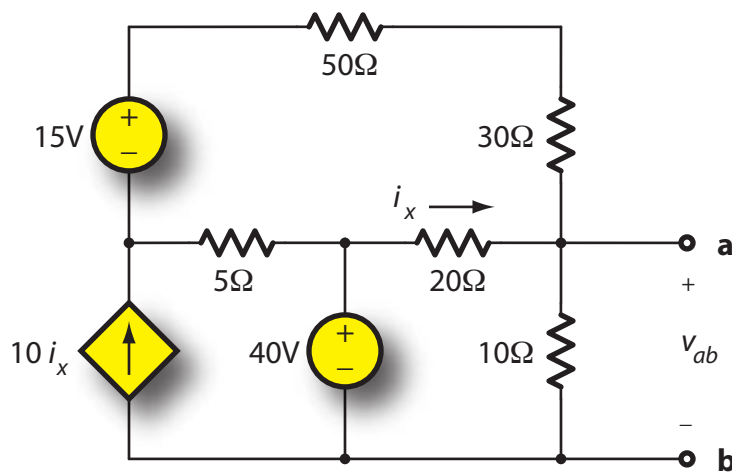


Fig. Q3. Determine the Thévenin equivalent circuit; find v_{ab} for three cases.

[13 marks total.]

(Question 3, additional workspace ...)

4. Consider the circuit given in Fig. Q4, which is exactly the same circuit as in Fig. Q2. Determine v_x using the principle of superposition.

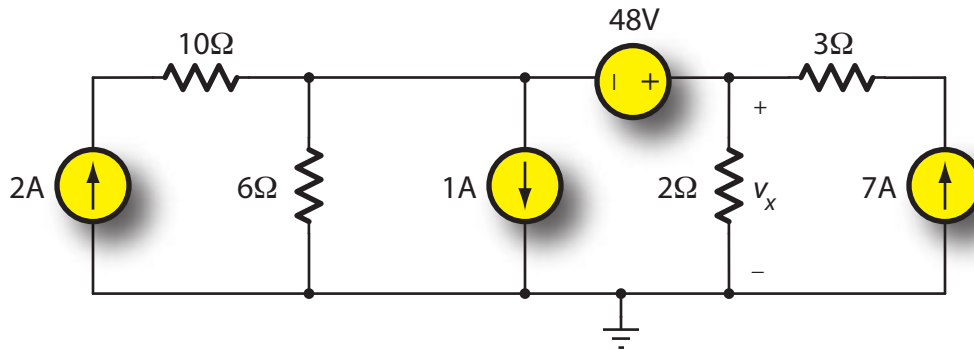


Fig. Q4. Find v_x by superposition.

[13 marks total.]

(Question 4, additional workspace ...)