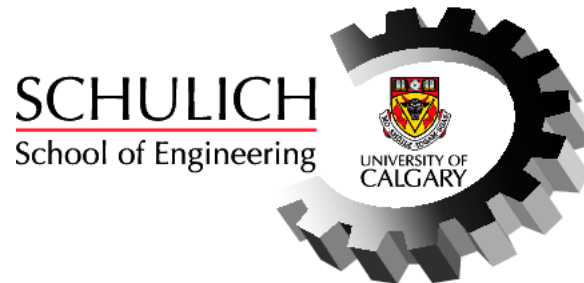


Name or ID: _____

Lecture Section: **L20**



ENGG 325 - Electric Circuits and Systems

Midterm Examination

Tuesday, June 6, 2006

Time: 1:00 - 2:30 PM

Instructions:

- Time allowed is 90 minutes.
 - The examination is closed-book.
 - Any type of portable calculator is permitted.
 - The maximum number of marks is 50, as indicated; 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.
-

Name: _____, ID: _____

1. Consider the bridge circuit in Fig. Q1.

(a) Using the method of your choice, determine the open-circuit voltage v_{ab} between the terminals **a** and **b**.

[4 marks.]

(b) In Fig. Q1, assume that a 10-volt voltage source is connected between terminals **a** and **b**, with the positive terminal on **a**. Using the *mesh-current method*, determine the current in this voltage source.

[8 marks.]

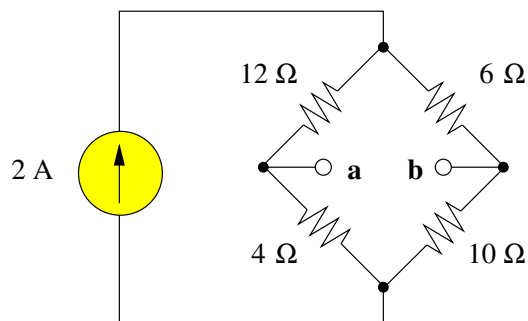


Fig. Q1. Find open-circuit voltage v_{ab} and then the current in a 10V source between **a** and **b**.

[12 marks total.]

(Question 1, additional workspace ...)

2. Determine and sketch the Thévenin equivalent circuit for the circuit given in Fig. Q2.

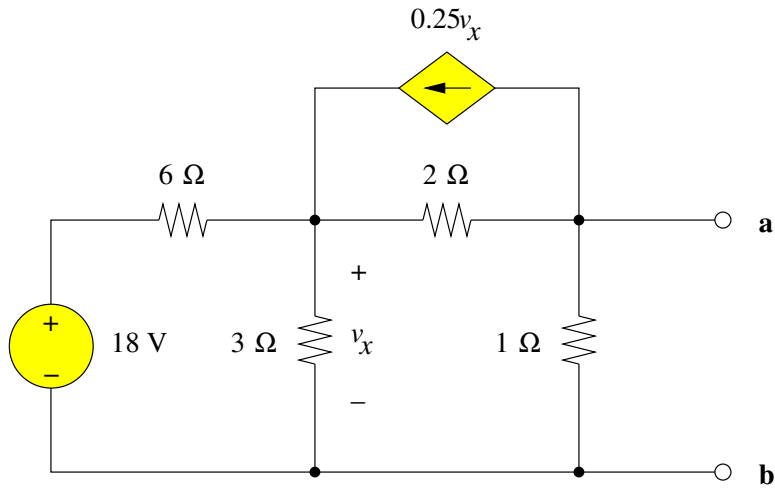


Fig. Q2. Find the Thévenin equivalent circuit.

[13 marks.]

(Question 2, additional workspace ...)

3. Consider the circuit shown in Fig. Q3.

- (a) Using the method of your choosing, determine the branch current i_x . **[10 marks.]**
- (b) Determine the power in the 4A current source, and indicate whether this power is generated or absorbed. **[3 marks.]**

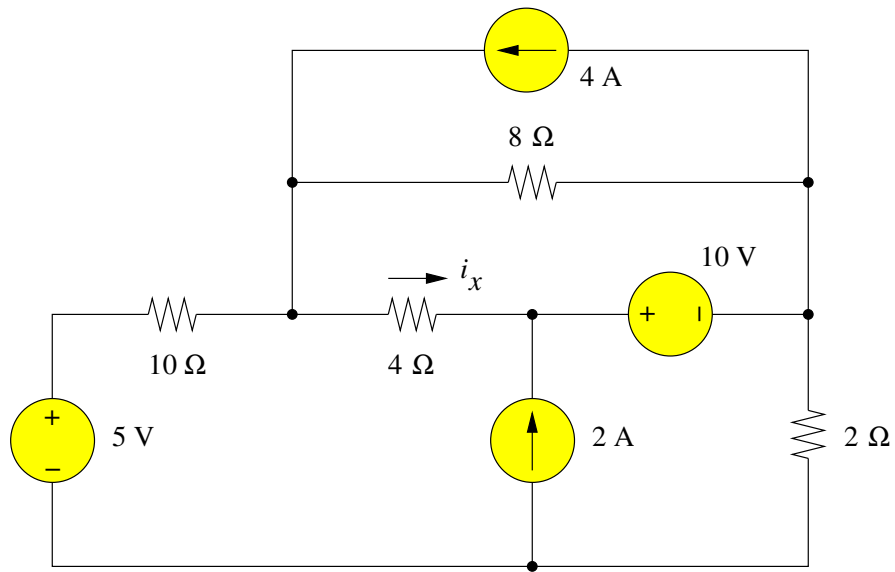


Fig. Q3. Determine i_x and the power in the 4A current source.

[13 marks total.]

(Question 3, additional workspace ...)

4. For the circuit given in Fig. Q4, determine v_x by superposition.

[12 marks.]

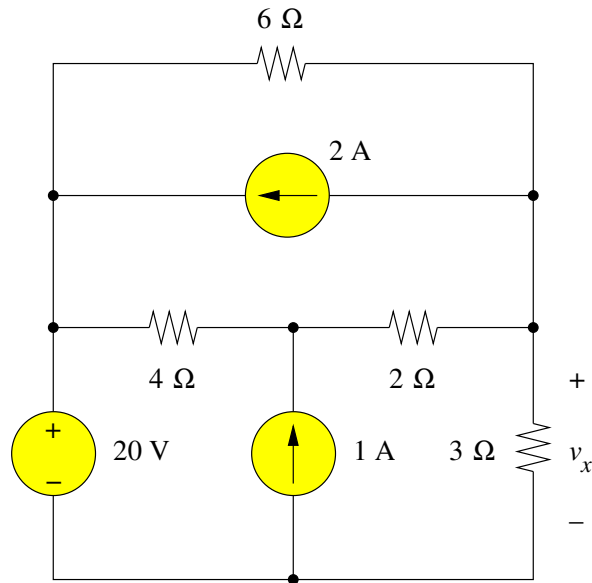


Fig. Q4. Determine v_x by superposition.

(Question 4, additional workspace ...)