

Signature

Name (print, please)

ECE 2300 Circuit Analysis

Summer 2011

Quiz 2

**DO NOT OPEN THIS QUIZ BOOKLET UNTIL INSTRUCTED
TO DO SO**

This quiz has 3 pages including this cover page. If you are missing any pages, raise your hand. You have 25 minutes to complete the quiz.

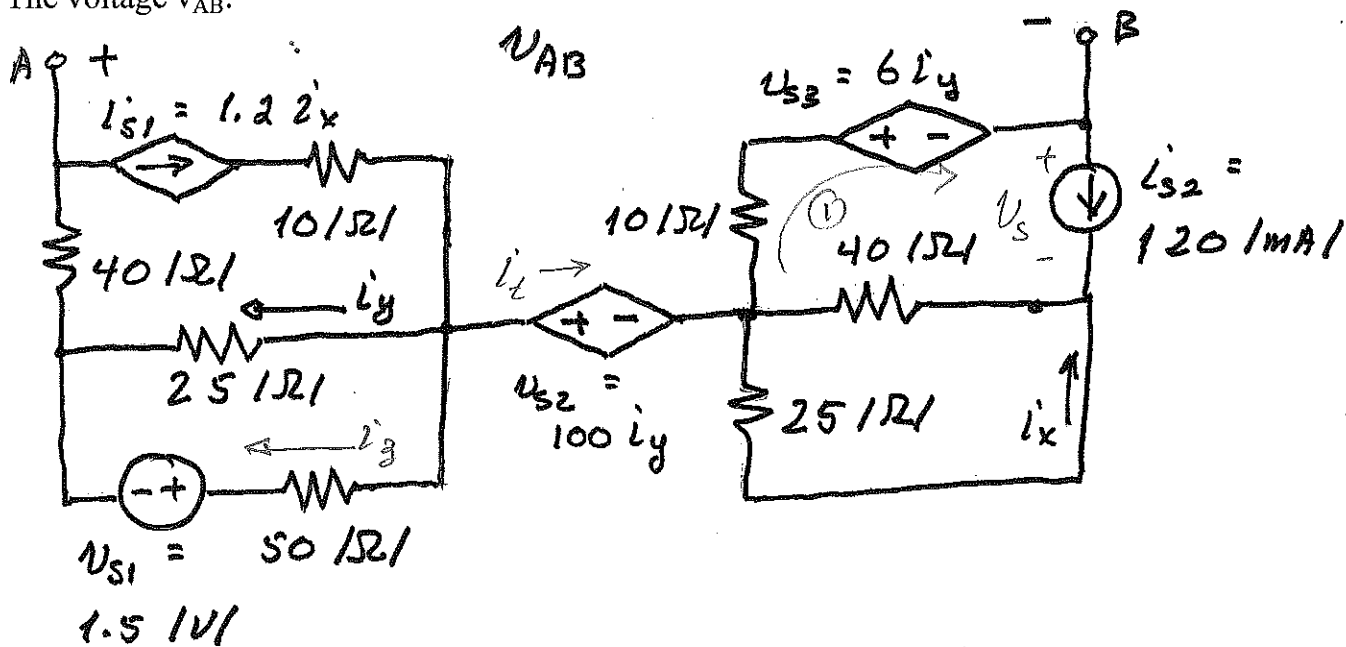
Notes

1. Be sure your name and signature appear above.
2. The quiz is closed-book. You may have a calculator and one 8 ½" x 11" crib sheet.
3. To receive full credit for a problem, you must:
 - Show all work necessary to solve the problem;
 - Define all variables and parameters and label them on circuit diagrams;
 - Use the proper notation for all variables.
 - Show all units explicitly in intermediate and final results;
 - Indicate clearly whether power being calculated is absorbed or delivered;

_____ /50

In the circuit shown find:

- The power delivered by current source i_{s2} ;
- The power delivered by the voltage source v_{s2} ;
- The voltage v_{AB} .



i. we can use CDR to find i_x :

$$i_x = -i_{s2} \cdot \frac{40}{40+25} = -0.07385 \text{ A}$$

Now we label i_y and we have

$$\text{KCL} \quad i_y + i_x = 1.2 i_x$$

$$\text{KVL} \quad -v_{s1} - 50 i_y + 25 i_x = 0$$

solving together gives

$$i_y = -0.03908 \text{ A}$$

$$i_x = -0.04954 \text{ A}$$

KVL $\textcircled{1}$ gives

$$6 i_y + v_s - 25 i_x + 10 i_{s2} = 0$$

$$v_s = 25 i_x - 10 i_{s2} - 6 i_y = -2.81181 \text{ V}$$

$$P_{del, i_{s2}} = -P_{abs, i_{s2}} = -v_s \cdot i_{s2} = +0.337 \text{ W}$$

Room for Extra Work

$$ii) \quad i'_t = 0 \Rightarrow P_{del, v_{s2}} = 0.$$

Note that if $i'_z + i'_y = i'_{s1}$, then i'_t must be 0!

iii) There are many KVLs that could be used to find V_{AB} .
Here is one:

$$V_{AB} - 6i'_y - 10i'_{s2} - 100i'_y + 25i'_y + 40i'_{s1} = 0$$

$$\begin{aligned} V_{AB} &= 6i'_y + 10i'_{s2} + 25i'_y - 40i'_{s1} \\ &= 81i'_y + 10i'_{s2} - 40i'_{s1} \end{aligned}$$

$$V_{AB} = 6.579 \text{ V}$$