ECE 2210/00 Exam 1 given: Fall 17

(The space between problems has been removed.)

Closed Book, Closed notes, Calculators OK, Show all work to receive credit

Circle answers, show units, and round off reasonably

To get the most possible partial credit, always show all the intermediate values that you can calculate. If further calculations depend on a value that you can't figure out, just use a letter (like I_{R1}) or a guessed value and proceed.

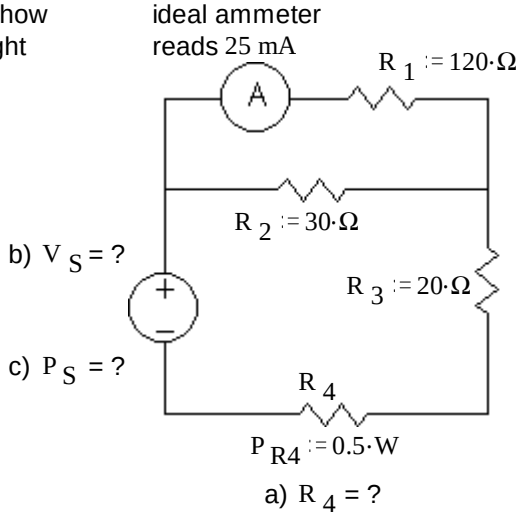
1. (23 pts) The ammeter, A, reads 25 mA.

   a) The power dissipated by R_4 is 0.5 W, what is the value of R_4. Assume that the ammeter is ideal (has no resistance).

   b) What is the value of V_S?

   c) How much power is provided by the source?

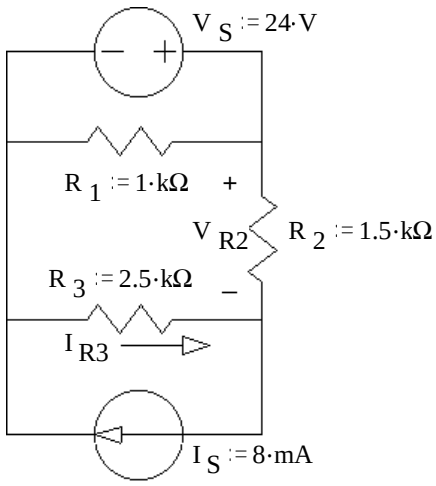
Note: feel free to show answers & work right on the schematic



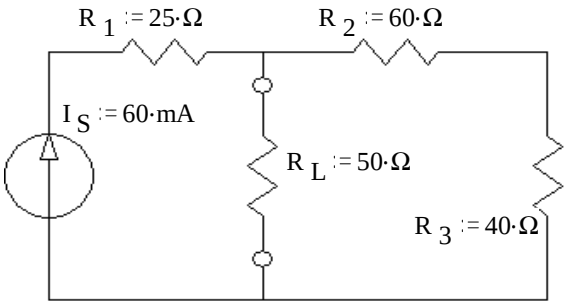
2. (23 pts) a) Use the method of superposition to find I_{R3} and V_{R2}. Be sure to clearly show and **circle** your intermediate results.

   I_{R3} = ?

   V_{R2} = ?



3. (21 pts) a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is R_L.



   b) Find and draw the Norton equivalent of the same circuit.

   c) Find the load voltage using your Norton equivalent circuit.

   d) Find the power dissipation in the load. resistor (R_L). P_{RL} = ?

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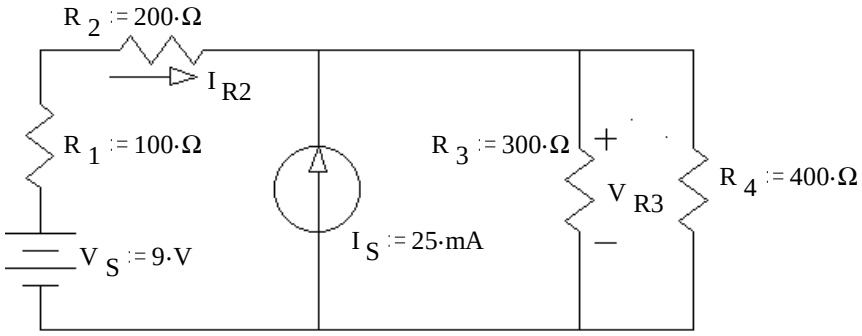
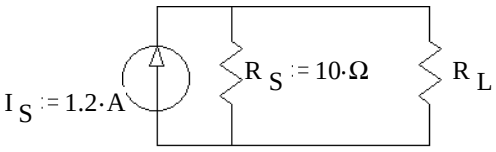
4. (25 pts) a) Use nodal analysis to find the voltage across R_3 (V_{R3}).

   You **MUST** show all the steps of nodal analysis work to get credit, including drawing appropriate symbols and labels on the circuit shown.

   b) Find the current through R_2 (I_{R2}).
   I_{R2} = ?



5. (8 pts) Consider the circuit at right.
   a) What value of load resistor (R_L) would you choose if you wanted to maximize the power dissipation in that load resistor.



   Note: If you don't know how to find this, make a guess so that you can calculate an answer for part b).

   b) With that load resistor (R_L) find the power dissipation in the load.

Answers

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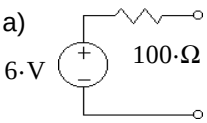
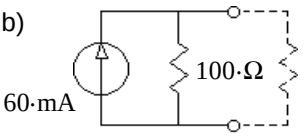
1. a) 32·Ω b) 9.5·V c) 1.19·W

2. - 3·mA 16.5·V

3. a)



b)



c) 2·V
d) 80·mW

4. a) 6·V b) 10·mA

5. a) 10·Ω b) 3.6·W