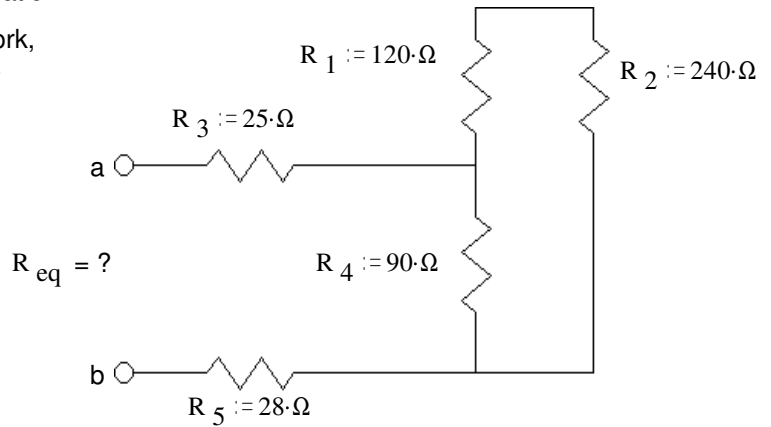


ECE1050/60 Exam 1 given: Spring 05 (The space between problems has been removed.)

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.

Feel free to show answers & work right on the schematic

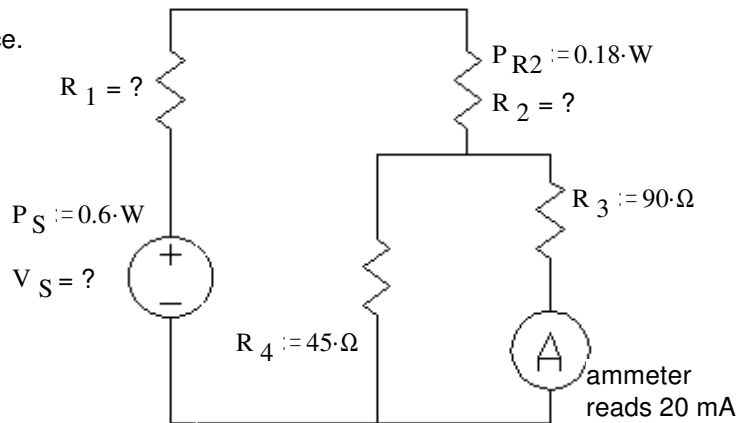
1. (9 pts) Find the equivalent resistance of this network, i.e. what would an ohmmeter read if hooked to the terminals a and b.



2. (5 pts) A 15V source is hooked to the terminals a and b above. Use the voltage divider concept to find the voltage across resistor R_4 .

3. (21 pts) The ammeter, A, reads 20 mA. Remember that ideal ammeters have no resistance.

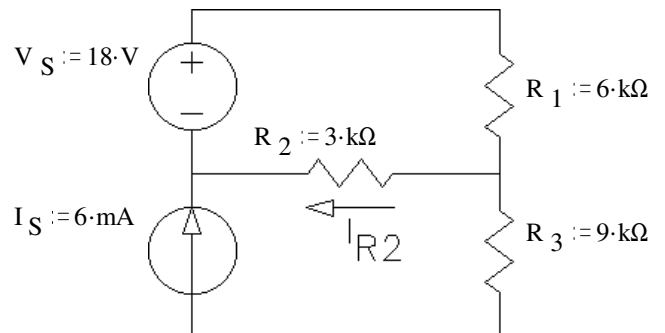
- a) The power dissipated by R_2 is 0.18 W, what is the value of R_2 ?



- b) The source provides 0.6W of power. What is the value of V_S ?

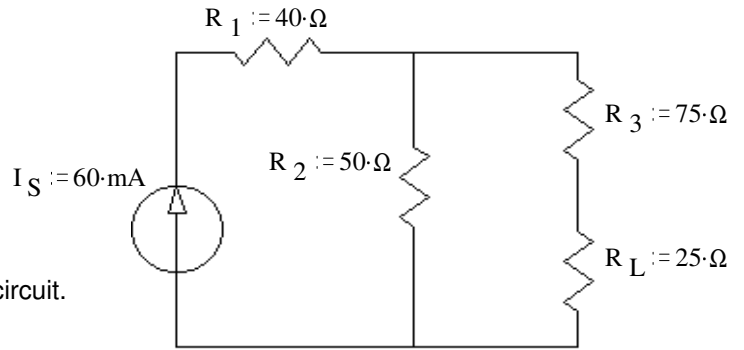
- c) What is the value of R_1 ?

4. (15 pts) a) Use the method of superposition to find the current through R_2 . Be sure to clearly show and **circle** your intermediate results.



ECE 1050/60 Exam 1 Spring 05 p2

5. (20 pts) a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is R_L .

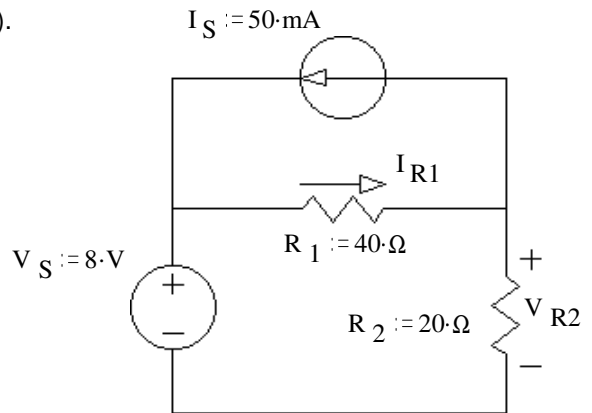


b) Find and draw the Norton equivalent of the same circuit.

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

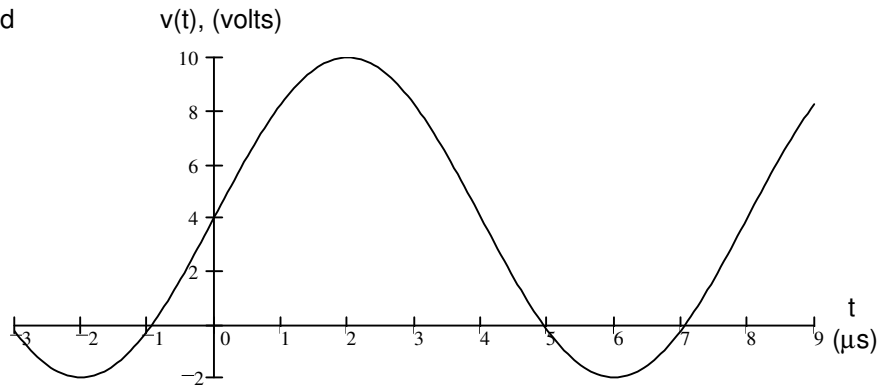
6. (18 pts) a) Use nodal analysis to find the voltage across R_2 (V_{R2}).

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_1 (I_{R1}).

7. (12 pts) For the waveform shown, find a complete expression for $v(t)$ as a cosine wave. Include numbers and units.



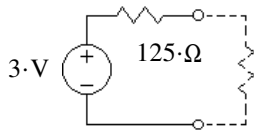
Answers

1. $125 \cdot \Omega$ 2. $8.64 \cdot V$

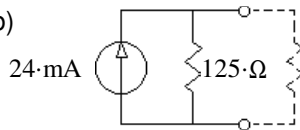
3.a) $50 \cdot \Omega$ b) $10 \cdot V$ c) $86.7 \cdot \Omega$

4. $2 \cdot mA - 4 \cdot mA = -2 \cdot mA$

5. a)



b)



c) $0.5 \cdot V$

6.a) $2 \cdot V$ b) $150 \cdot mA$

7. $6 \cdot V \cdot \cos\left(785400 \cdot \frac{rad}{sec} \cdot t - 90 \cdot deg\right) + 4 \cdot V$

ECE 1050 / 60 Midterm #1 Arn Stolp

Name _____

Scores:

Pages 1&2 _____ of a possible 35 pts

Pages 3&4 _____ of a possible 35 pts

Pages 5&6 _____ of a possible 30 pts

Total _____ of a possible 100 pts