ENGR 065 Circuit Theory

Laboratory 2

Resistor Combinations, KCL, KVL, Voltage and Current Dividers

Objectives

- Verify KCL and KVL
- Measure resistor combinations
- Measure branch currents and node voltages

Equipment and components

- A computer
- Matlab software

Preliminary

1. Refer to Chapters 2 and 3 of the textbook if necessary.
2. Complete the theoretical calculations related to this lab.

Procedure

1. Open Matlab
2. Create Simulink model of the circuit shown below by following the procedure in Lab 1
3. Fill up your simulation results in the following table.

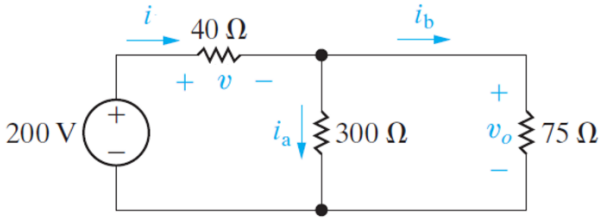

Table 1 (The source = 200 V)

	Simulation Results	Theoretical Results
i		
i_a		
i_b		
v		
v_o		

a. What is the sum of i_a and i_b ? Sum = _____. What is i ? Explain.
b. What is the sum of v and v_o ? Sum = _____. Explain.
c. Are your simulation results consistent with your theoretical results of Problem 2.18 in Assignment 2?
d. Set the voltage source to be 100 V and repeat the above steps. Fill up the table below. Comparing the results in Table 2 with those in Table 1, what do you find?

Table 2 (The source = 100 V)

	Simulation Results	Theoretical Results
i		
i_a		
i_b		
v		
v_o		

e. Set the voltage source to be $-200\ V$ repeat the above steps 1, 2, and 3. Fill up the table below. Comparing the results in Table 3 with those in Table 1, what do you find?

Table 3 (The source = -200 V)

	Simulation Results	Theoretical Results
i		
i_a		
i_b		
v		
v_o		

1. Create the Simulink model of the following circuit and find i_g and i_o. Fill up the table shown below. Are the simulation solutions consistent with your theoretical solutions of Problem 3.28 in Assignment 2?

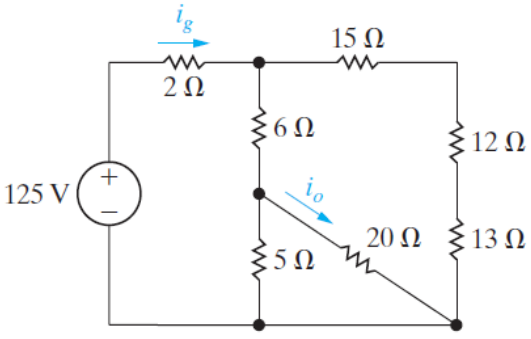

Table 4

	Simulation Results	Theoretical Results
i_g		
i_0		

2. Create the Simulink model of the following circuit and find v_1 and v_2. Are the simulation solutions consistent with your theoretical solutions of Problem 3.30 in Assignment 2? Fill up the table shown below.

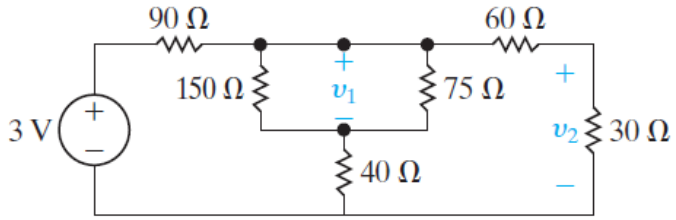

Table 5

	Simulation Results	Theoretical Results
v_1		
v_2		

Questions and conclusions

- Use tables and graphs to explain your results.
- Summarize your findings and explanations in response to the questions posed in this lab.