CS 2268
Simulation #1: Series-Parallel DC Circuits

Simple series-parallel networks may be viewed as interconnected series and parallel sub-networks. Each of these sub-networks may be analyzed through basic series and parallel techniques, such as applying voltage divider and current divider rules along with Kirchhoff's voltage and current laws. It is important to identify the simplest series and parallel connections to jump to more complex interconnections.

Schematic Diagram:

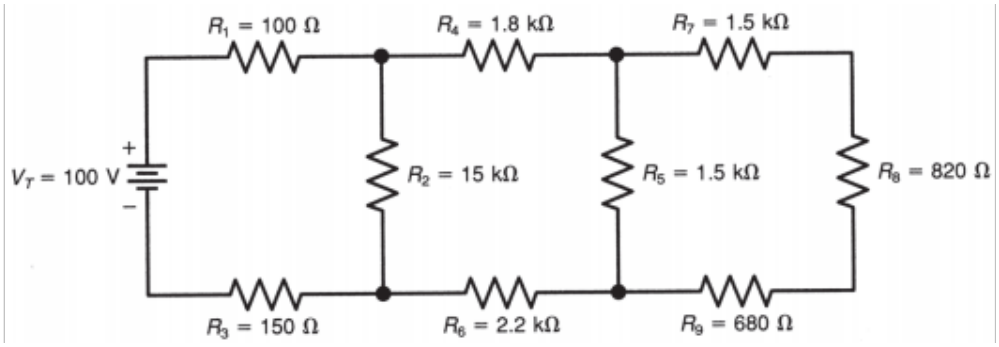

Figure 1

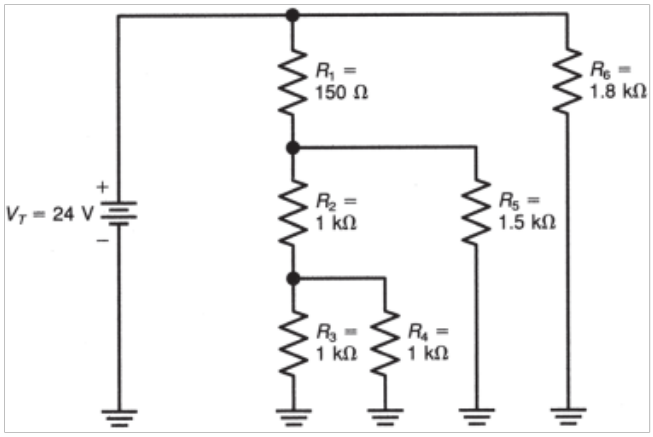

Figure 2

Procedure:

1. Build the circuit of Figure 1 in NI Multisim. Determine the theoretical (computed) currents in all resistors. Record these values in Table 1.
2. Measure the currents and record these values in Table 1.
3. Determine the theoretical (computed) voltage drop in all resistors. Record these values in Table 2.
4. Measure the voltage drop in each resistor and record these values in Table 2.
5. Build the circuit of Figure 2 and perform steps 2-4. Record the values in Table 3 and 4, respectively.

Table 1

Current	I (theory)	I (measured)
IT		
I_{R1}		
I_{R2}		
I_{R3}		
I_{R4}		
I_{R5}		
I_{R6}		
I_{R7}		
I_{R8}		
I_{R9}		

Table 2

Voltage	V (theory)	V (measured)
V_{R1}		
V_{R2}		
V_{R3}		
V_{R4}		
V_{R5}		
V_{R6}		
V_{R7}		
V_{R8}		
V_{R9}		

Table 3

Current	I (theory)	I (measured)
IT		
I_{R1}		
I_{R2}		
I_{R3}		
I_{R4}		
I_{R5}		
I_{R6}		

Table 4

Voltage	V (theory)	V (measured)
V_{R1}		
V_{R2}		
V_{R3}		
V_{R4}		
V_{R5}		
V_{R6}		

Question:

1. What would happen to the current in R_4 if a 10kΩ was added in series? What will be the new current, I_{R4}?

Conclusion: