Izmir Institute of Technology
Elec. & Electronics Eng. Dep.
Circuit Lab.

Voltage and Current Division
Lab#1

Preparation Task

Problem 1: Calculate the values of V_1, V_2 and V_3 for the circuit shown in Figure 1.

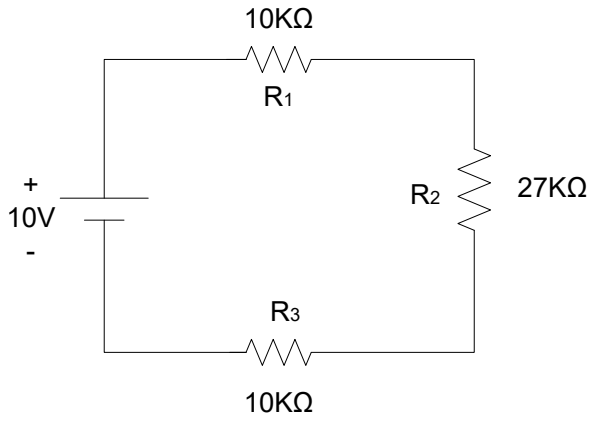

Figure 1: Series Circuit for Problem 1

Problem 2: Calculate the values of I_1, I_2 and I_3 for the circuit shown in Figure 2.

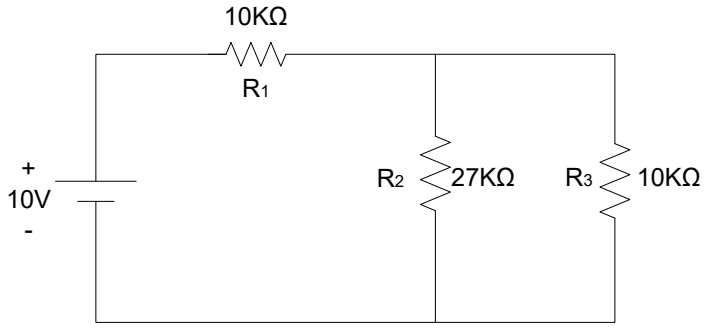

Figure 2: Series paralel circuit for Problem 2

Lab Work

1. Adjust the DC power supply to 10V. Set up a circuit with two 10KΩ resistors and one 27KΩ resistor as shown in Figure 1. Measure the actual values of these resistors and the power supplies voltage. Record your data in Table 1. Be sure to keep track of resistors and not mix them up since you have measured their values.

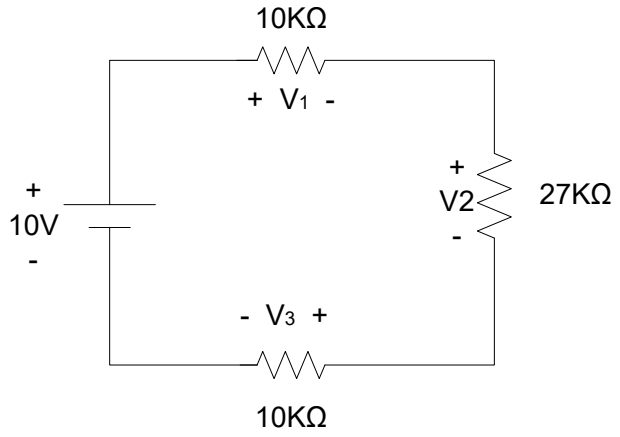

Figure 1. *Circuit to verify Kirchhoff's Voltage Law*

Table 1. *Measured Data for Figure 1.*

Component/ Value	Nominal R Value (kΩ)	Measured R Value (kΩ)	Measured Voltage (V)
R_1, V_1			
R_2, V_2			
R_3, V_3			

2. Using your measured values for R_1, R_2, R_3 and Vs, calculate the voltage drops for V_1, V_2, and V_3. Write the values in the "Calculated Volts" column in Table 2. Measure the actual V_1, V_2, and V_3. Write the values in the "Measured Volts" column in Table 2. Calculate the % error between the calculated and measured voltages.

Table 2. *Calculated Data and Errors for Figure 1.*

Component/ Value	Calculated Volts (V)	Measured Volts (V)	% Error
R_1, V_1			
R_2, V_2			
R_3, V_3			

3. The errors you obtained in Table 2 should be less than 5%. If they have are not, try to find the reason why.

4. Construct the circuit shown in Figure 2. Measure the actual value of the supply voltage and the values of the resistors you use.

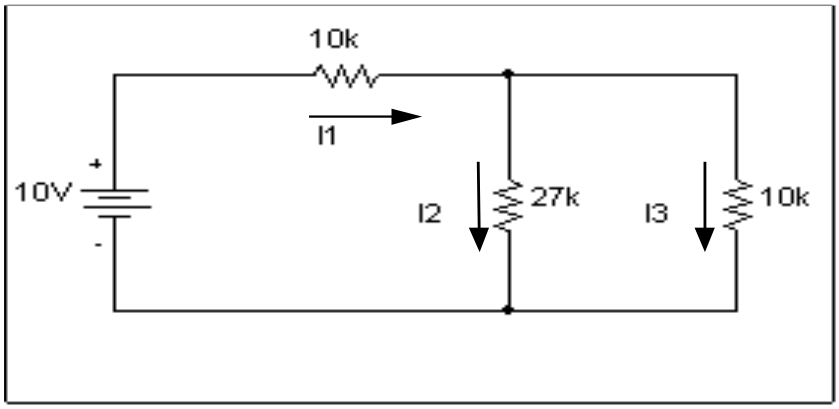

Figure 2. *Circuit to verify Kirchhoff's Current*

5. Repeat steps 1 and 2 for the currents I_1, I_2, and I_3. Record your data in Tables 3 and 4. Always turn off the power when you are making changes in the circuit, such as moving the ammeter to measure a different current.

Table 3. *Measured Data for Figure 2.*

Component / Value	Nominal R Value (kΩ)	Measured R Value (kΩ)	Measured Current (mA)
R_1, I_1			
R_2, I_2			
R_3, I_3			

Table 4. *Calculated Data and Errors for Figure 2.*

Component/ Value	Calculated Amps (mA)	Measured Amps (mA)	% Error
R_1, I_1			
R_2, I_2			
R_3, I_3			