ECET 102/CPET101

Lab 5
Parallel Circuit Lab

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Required Devices & Equipment:

Resistors: 820Ω x 1, 1.2kΩ x 2
Bread board x 1 with wires, wire strippers and cutters
Variable Power Supply x 1
Digital Multimeter (DMM) x 1

Objectives:

1. Learn parallel resistor circuits and measurement.
2. Learn to use the circuit design and simulation program, Multisim, for circuit analysis.
3. Verify Kirchoff's Current Law (KCL)

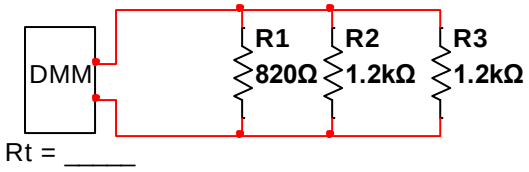
Procedure:

Part 1. Three Resistor in Parallel and Current Measurement

a) Use a DMM to measure the resistance of the three resistors R1, R2, and R2 and record the values:
   R1 = R_{820} = _____ Ω
   R2 = $R_{1.2k}$ = _____ Ω
   R3 = $R_{1.2k}$ = _____ Ω

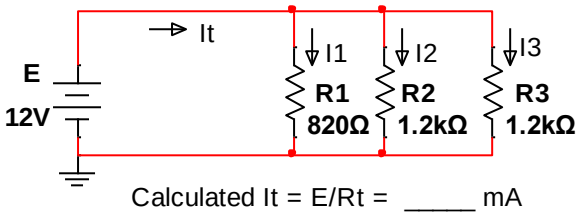
b) Manually calculate the total circuit resistance Rt = 1/(1/R1 + 1/R2 + 1/R3) = _____Ω.

c) Set up the circuit as shown in Figure 1 using the three resistors, then use the DMM (set to Ohm measurement) to measure the total parallel resistance Rt = _____ Ω.

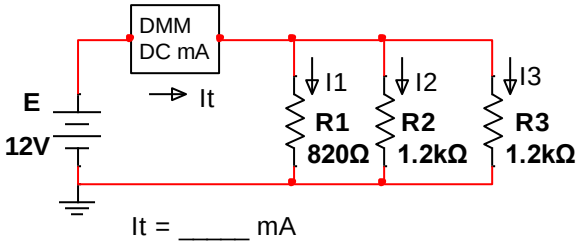


d) Compare the results obtained from (a) and (b).

e) Calculate the total circuit current It = _____ mA, and record the calculated It in Table 1.



f) Connect the variable power supply, set to 12V. Use the DMM (set to DC I measurement) to measure the current It = _____ mA, and record the It in Table 1.

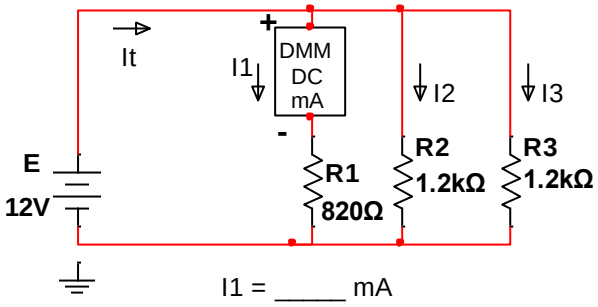


g) Compare the results obtained from (e) and (f).

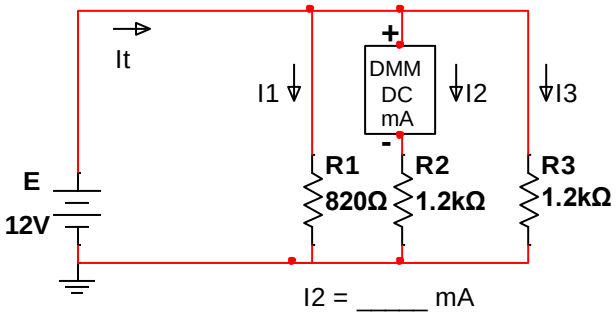
h) Calculate all branch currents I1 = _____ mA, I2 = _____ mA, and I3 = _____ mA and record the values in Table 1.

i) Measure the branch circuit currents I1, I2, and I3, then record their values in the Table 1.

- Connect the DMM as shown below for I1 measurement



- Connect the DMM as shown below for I2 measurement



- Connect the DMM as shown below for I3 measurement

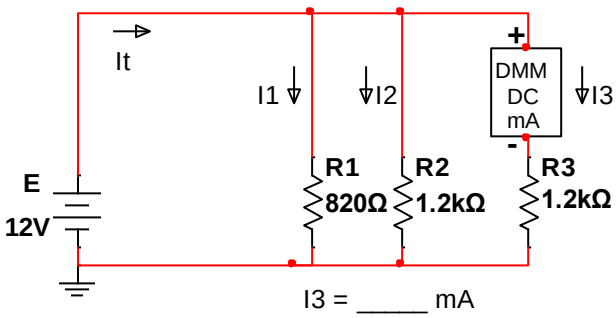


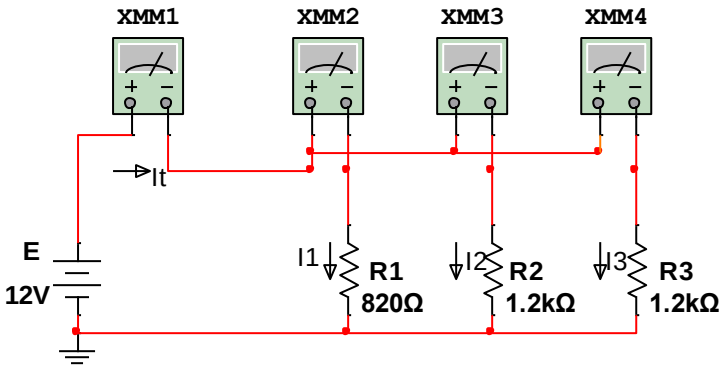
Table 1. Measured and calculated currents

	I1	I2	$I3_t$	It
Calculated values				
Measured values				
Simulated values				

j) Verifying the KCL

It = _____ = I1 + I2 + I3 = _____

Part 2. Prepare a Multisim simulation circuit as shown below. Run the simulated circuit and record I1, I2, I3, and It.



a) Explain among the calculated, measured and simulated values.