EAST WEST UNIVERSITY

Department of Computer Science and Engineering

Course Title: Electrical Circuits

Course Number: 209

Semester: 4th

Experiment No.: 02

Experiment Title: Series-Parallel DC Circuit and Verification of Kirchhoff's Laws

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Objectives:

1. To learn analysis of dc series-parallel circuit.
2. To verify Kirchhoff's Voltage Law (KVL).
3. To verify Kirchhoff's Current Law (KCL).

Circuit Diagram:

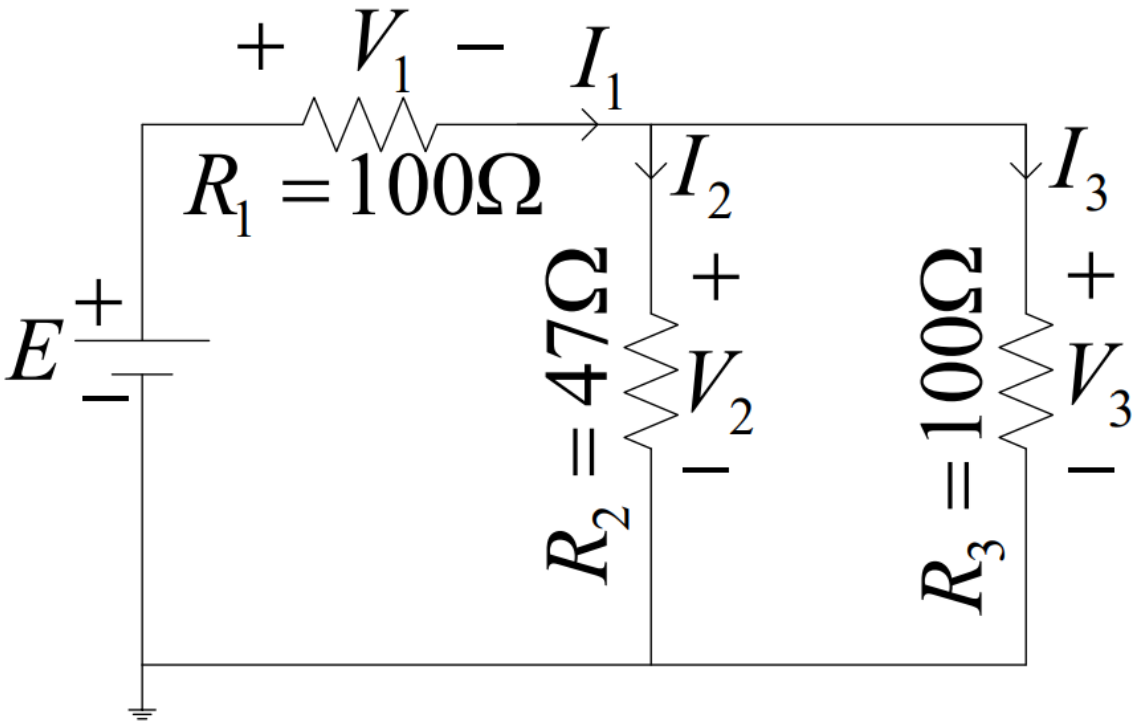

Figure: Circuit for Experiment

Table 01.Data Sheet:

Measured Value of *E* (V)	Measured Value of *V1 (V)*	Measured Value of V_2*(V)*	Measured Value of V_3 *(V)*	Measured Value of *I1 (mA)*	Measured Value of I_2 *(mA)*	Measured Value of I_3 *(mA)*	Measured Value of Resistance (Ω)
3	2.273	0.727	0.727	22.732	15.463	7.269	R_1 = 100 R_2 = 47 R_3 = 100

Answers to the post lab report questions:01

Simplifying the cicuit,

*R*p = *R*2 || *R*3

= *47* || *100*

= 31.973 Ω

*R*eq = *R*p +*R*1 =(31.973+ 100) Ω= 131.973 Ω

For *I1,*

$I1 = \frac{E}{R1+Rp}$ = 0.022732 A= 22.732 mA

Using CDR,

$$I2 = \frac{R3 \times I1}{R2 + R3} = \frac{22.732 \times 100}{47 + 100} = 15.463\ mA$$

$$I3 = \frac{R2 \times I1}{R2 + R3} = \frac{22.732 \times 47}{47 + 100} = 7.269\ mA$$

Using Ohm's law,

$$V1 = I1 \times R1 = (100 \times 22.732)V = 2.273\ V$$

$$V2 = I2 \times R2 = (15.463 \times 47)V = 0.727\,V$$

$$V3 = I3 \times R3 = (100 \times 7.269)V = 2.273\,V$$

There is no discrepancy in PSpice.

Answers to the post lab report questions:02

1) $V2 = V3$
2) $E = V1 + V2 = (0.727 + 2.273)V = 3\,V$
3) $I1 = I2 + I3 = (15.463 + 7.269)mA = 22.732\,mA$

Conclusion:

We verified KCL and KVL in this experiment and found no discripency in PSpice with our theoretically calculated values.