EXPERIMENT 3

KIRCHOFF'S LAWS

OBJECTIVE

To verify Kirchoff's voltage and current laws and to validate the conservation of power in linear resistive networks.

EQUIPMENT NEEDED

- Digital Multimeter (DMM)
- Avometer (AVO8)
- Power Supply
- Resistors

PRELIMINARY WORK

P1 Calculate all voltages and currents related with each element in the circuit given in Figure 3.1. Indicate the current direction and polarity of the voltages on the circuit.

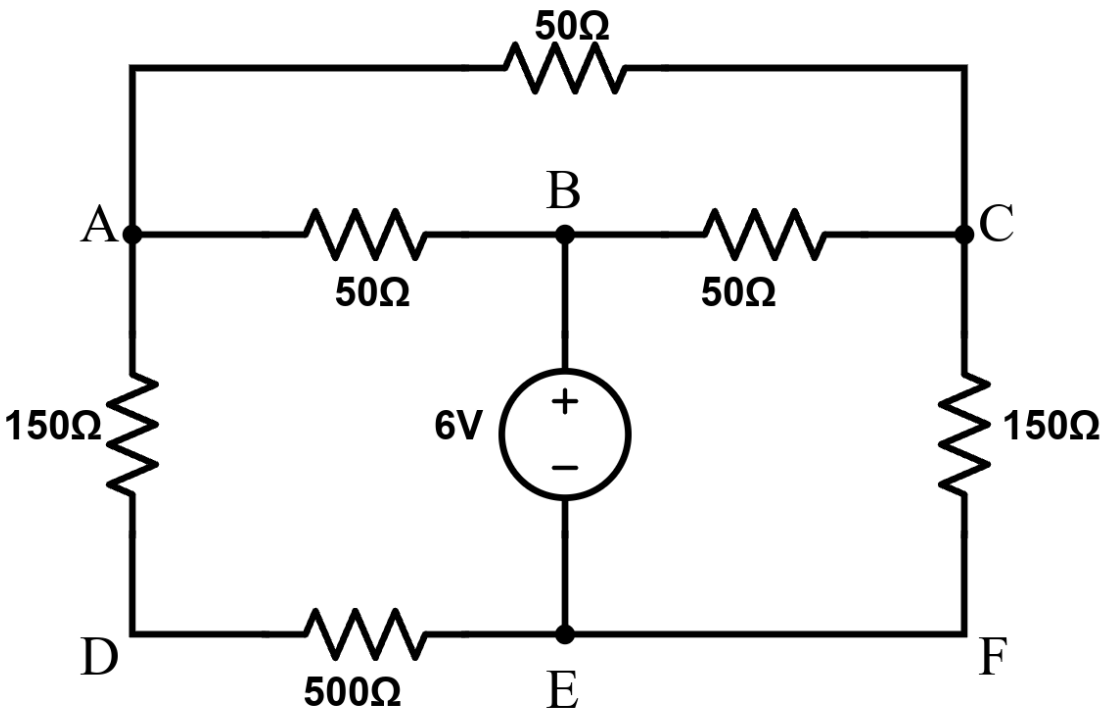

Figure 3.1

	50Ω (A − C)		50Ω (A − B)		50Ω (B − C)		150Ω (C − F)		150Ω (A − D)		500Ω (D − E)		V_{source}	
	V	I	V	I	V	I	V	I	V	I	V	I	V	I
Calculated														

P2 Calculate the power of each element. Compare the power delivered to the power consumed.

P3 Show that Kirchoff's voltage law is satisfied around the loops ABED, BCFE, ACB, ABCFED. (Show that sum of the voltages around these paths are zero)

P4 Show that Kirchoff's current law is satisfied at nodes A, B, C, E (Show that sum of the currents at these nodes is zero)

EXPERIMENTAL WORK

E1 Measure component voltages and currents in Figure 3.1 Indicate the polarity of voltages and directions of currents.

	50Ω (A − C)		50Ω (A − B)		50Ω (B − C)		150Ω (C − F)		150Ω (A − D)		500Ω (D − E)		V_{source}	
	V	I	V	I	V	I	V	I	V	I	V	I	V	I
Theoretical														
Measured														

E2 By using the results obtained in E1, calculate the power absorbed or delivered by each element.

E3 Verify the Kirchoff's voltage law in the loops ABED, BCFE, ACB, ABCFED

E4 Verify the Kirchoff's current law at nodes A, B, C, E.