

EXPERIMENT 1

INTRODUCTION TO LAB EQUIPMENT

OBJECTIVE

Be able to measure resistance, voltage, and current.

EQUIPMENT NEEDED

- Digital Multimeter (DMM)
- Power Supply
- Resistors

PRELIMINARY WORK

P1 Calculate R_T , V_{R1} , V_{R2} and I for Figure 1.1.

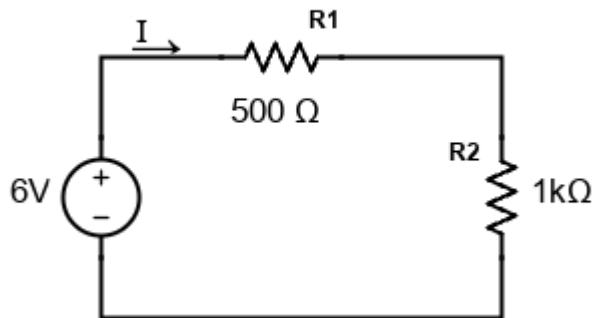


Figure 1.1

Table 1.1

	R_T	V_{R1}	V_{R2}	I
Calculated				

P2 Calculate R_T , V_{R1} , V_{R2} and I for Figure 1.2.

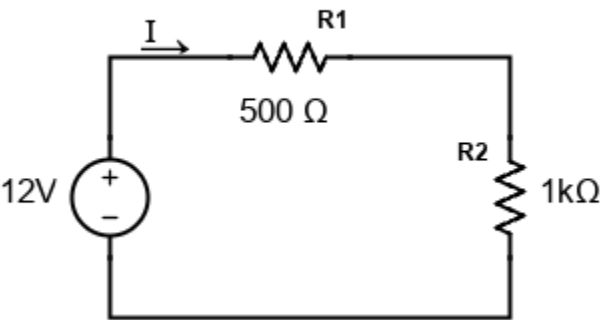


Figure 1.2

Table 1.2

	R_T	V_{R1}	V_{R2}	I
Calculated				

P3 For the circuit given in Figure 1.3, calculate the voltages across and currents through each circuit element. Using these values, determine the power absorbed or delivered by each circuit element. Include your calculations in your laboratory notebook. Record all of your calculated results in Table 2.1 for later comparison with your experimental values.

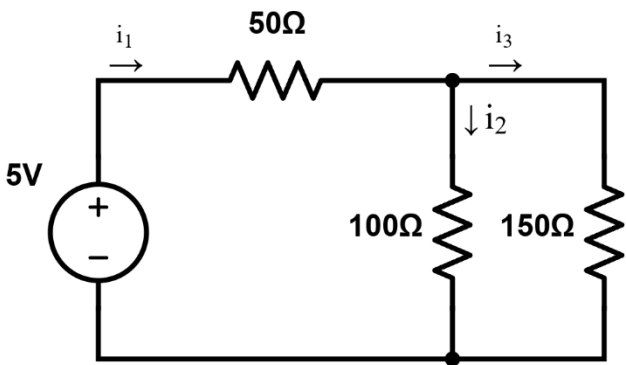


Figure 1.3

Table 1.3

	Voltage (V)	Current (mA)	Power (mW)
50 Ω			
100 Ω			
150 Ω			
V_{source}	5V		

EXPERIMENTAL WORK

E1 Setup the circuit given in Figure 1.1. Verify the theoretical values found in preliminary work.

Table 1.4

	R_T	V_{Source}	V_{R1}	V_{R2}	I
Theoretical					
Measured					
Percent Error					

E2 Setup the circuit given in Figure 1.2. Verify the theoretical values found in preliminary work.

Table 1.5

	R_T	V_{Source}	V_{R1}	V_{R2}	I
Theoretical					
Measured					
Percent Error					

E3 Setup the circuit given in Figure 1.3. Verify the theoretical values found in preliminary work.

Table 1.6

	Theoretical			Experimental		
	Voltage (V)	Current(mA)	Power(mW)	Voltage(V)	Current (mA)	Power(mW)
50 Ω						
100 Ω						
150 Ω						
V_{source}						

CONCLUSION

Answer the following questions individually in your laboratory report. Support your answers with your experimental results and relevant calculations.

C1. Explain at least three possible reasons for the differences between your theoretical and experimental results. Relate your explanations to your measurements.

C2. What precautions must be taken when measuring resistance with a digital multimeter? Explain why the circuit must be disconnected from the power supply and why measuring a resistor while it is connected to other components may give an incorrect result.

C3. Explain how a digital multimeter must be connected to measure voltage and current. What could happen if a multimeter set to current measurement is connected directly across the power supply terminals?