Series Circuits Lab

Directions: Complete the simple circuits described below and measure the current flowing through the circuit and voltage drop across the resistors and lamps.

Measuring Voltage: Set the multimeter to volts and record in volts

Measuring current: Set the multimeter to Amps, plug jack into 10A and record in Amps

1. A circuit with a 1.5 V battery and (1) light bulb. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop _____

Current _____

2. A circuit with a 1.5 V battery and (2) short light bulbs. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop Light 1 _____

Voltage Drop Light 2 _____

Current in circuit _____

3. A circuit with (2) 1.5 V batteries and (1) short light bulb and (1) switch. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop _____

Current in circuit _____

4. A circuit with (2) 1.5 V batteries and (2) short light bulbs. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop Light 1 _____

Voltage Drop Light 2 _____

Current in circuit _____

5. A circuit with (2) 1.5 V batteries, (1) long bulb and (1) 10Ω resistor. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop across lamp _____

Voltage Drop across 10Ω resistor _____

Current in circuit _____

6. A circuit with (2) 1.5 V batteries, (1) short light bulb and (1) long light bulb. Make the circuit using the materials provided and draw the circuit below.

Voltage Drop across short lamp _____

Voltage Drop across long lamp _____

Current in circuit _____

Postlab Questions:

1. Compare the brightness of the short light bulb in experiment #1 verses the brightness of the light bulbs in experiment #2.

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2. Were the light bulbs in Experiment #2 the same brightness or different in brightness from each other? Explain a reason for your observation.

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3. State the current readings for experiments #3 AND #4. Would you expect there to be a difference in the amount of current? State a reason to support your answer.

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4. Compare the voltage drops between the light bulb and the resistor in experiment #5. Which of the two offered more resistance to the flow of current? How can you tell?

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5. Compare the brightness of the two difference bulbs in experiment #6. How does brightness relate to the resistance of the light bulbs? Include the voltage drops in you answer.

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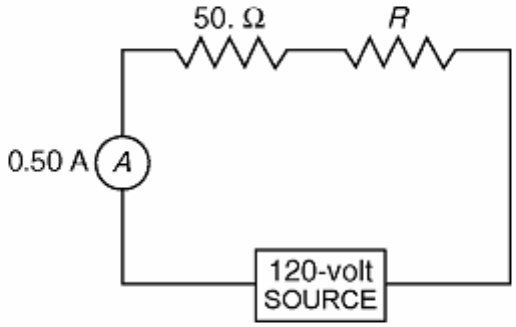
6. A 50.-ohm resistor, an unknown resistor *R*, a 120-volt source, and an ammeter are connected in a complete circuit. The ammeter reads 0.50 ampere.



a. Calculate the equivalent resistance of the circuit shown. [*Show all work, including the equation and substitution with units.*]

b. Determine the resistance of resistor *R* shown in the diagram.