
Parallel Circuits Lab Part I

Directions: Proceed to you designated lab station and assemble the following circuit.

1. Make a parallel connection with following so that the lightbulb lights when the circuit is closed. Draw the circuit using symbols from your RT in the space below.

- (1) light bulb
- (1) 68 ohm resistor
- (1) switch
- (2) 1.5 V batteries and holder
- (4) Wires with clips

Verify correct w/ Mr. O'Leary _____

2. Set the Multimeter to the D/C voltage setting of 20V. **Make sure that the black plug is in com 1 and the red plug is in the Ω -A com.** Determine the potential difference (voltage) across the lightbulb and resistor.

a) What is the voltage across the lightbulb? _____ V

b) What is the voltage across the resistor? _____ V

3. Set the Multimeter to the D/C current (A) setting of 10A. **Make sure that the black plug is in com 1 and the red plug is in the 10A com.** Determine the current running through the lightbulb and resistor.

c) What is the current running through the lightbulb? _____ A

d) What is the current running through the resistor? _____ A

4. What is the total current in the circuit as determined by the multimeter? _____ A

5. What us the total voltage as determined by the multimeter? _____ V

Calculations Using Ohm's Law

- Consider the battery to be of full strength (1.5 V)
- The resistance of the resistor is $68\ \Omega$
- Measure the resistance of the lightbulb and record it here _____ Ω

6. Calculate the total resistance of the circuit and show all work below.

Total Resistance _____ Ω

7. Calculate the current running through the lightbulb when the switch is closed and show all work below.

_____ A

8. Calculate the current running through the resistor when the switch is close and show all work below.

_____ A

9. What is the total current running through the circuit?

Total current _____ A

Postlab Questions:

1. Compare the current running though the lightbulb when measured by the multimeter to the current obtained using Ohm's law. State the values and reasons for any difference.

2. What are some sources of error?

Parallel Circuits Lab Part II

Materials:

- (3) lightbulbs of the same resistance and holders
- (2) 1.5 V batteries and holder
- (6) wires with clips

1. Make a parallel circuit with (3) lightbulbs and (2) batteries in the holder

a. How does the brightness of the bulbs compare? _____

b. Determine the voltage drop using the multimeter across each light bulb and record it here

i. Bulb 1 _____ V

ii. Bulb 2 _____ V

iii. Bulb 3 _____ V

c. Find the TOTAL current in the circuit and record it here _____ A

2. Disconnect bulb #3 and remove it from the circuit. Again, use the multimeter to determine the voltage drop across each resistor and record it here.

a. Bulb 1 _____ V

b. Bulb 2 _____ V

3. Find the TOTAL current in the circuit and record it here _____ A.

a. How does the total current compare to the total in question #1? _____

b. How does the brightness of the light bulbs compare to each other with bulb #3 being removed? _____

c. Are they any dimmer than before? _____

d. What can we say happens to the equivalent resistance when we removed Bulb #3? _____

