

Check Your Understanding

of Power

1. Which would be thicker (wider) - the filament of a 60-Watt light bulb or the filament of a 100-W light bulb? Explain.
2. Calculate the resistance and the current of a 7.5-Watt night light bulb plugged into a US household outlet (120 V).
3. Calculate the resistance and the current of a 1500-Watt electric hair dryer plugged into a US household outlet (120 V).
4. The box on a table saw indicates that the amperage at startup is 15 Amps. Determine the resistance and the power of the saw during this time.
5. The sticker on a compact disc player says that it draws 288 mA of current when powered by a 9 Volt battery. What is the power (in Watts) of the CD player?
6. A 541-Watt toaster is connected to a 120-V household outlet. What is the resistance (in ohms) of the toaster?
7. A color TV has a current of 1.99 Amps when connected to a 120-Volt household circuit. What is the resistance (in ohms)?

Check Your Understanding

of Ohm's Law

1. Which of the following will cause the current through an electrical circuit to decrease? Choose all that apply.
 - a. decrease the voltage
 - b. decrease the resistance
 - c. increase the voltage
 - d. increase the resistance
2. A certain electrical circuit contains a battery with three cells, wires and a light bulb. Which of the following would cause the bulb to shine less brightly? Choose all that apply.
 - a. increase the voltage of the battery (add another cell)
 - b. decrease the voltage of the battery (remove a cell)
 - c. decrease the resistance of the circuit
 - d. increase the resistance of the circuit
3. You have likely been warned to avoid contact with electrical appliances or even electrical outlets when your hands are wet. Such contact is more dangerous when your hands are wet (vs. dry) because wet hands cause _____.
 - a. the voltage of the circuit to be higher
 - b. the voltage of the circuit to be lower
 - c. your resistance to be higher
 - d. your resistance to be lower
 - e. the current through you to be lower

4. If the resistance of a circuit were tripled, then the current through the circuit would be ____.

- a. one-third as much
- b. three times as much
- c. unchanged
- d. ... nonsense! There would be no way to make such a prediction.

5. If the voltage across a circuit is quadrupled, then the current through the circuit would be ____.

- a. one-fourth as much
- b. four times as much
- c. unchanged
- d. ... nonsense! There would be no way to make such a prediction.

6. A circuit is wired with a power supply, a resistor and an ammeter (for measuring current). The ammeter reads a current of **24 mA** (milliAmps). Determine the new current if the voltage of the power supply was ...

- a. ... increased by a factor of 2 and the resistance was held constant.
- b. ... increased by a factor of 3 and the resistance was held constant.
- c. ... decreased by a factor of 2 and the resistance was held constant.
- d. ... held constant and the resistance was increased by a factor of 2.
- e. ... held constant and the resistance was increased by a factor of 4.
- f. ... held constant and the resistance was decreased by a factor of 2.
- g. ... increased by a factor of 2 and the resistance was increased by a factor of 2.
- h. ... increased by a factor of 3 and the resistance was decreased by a factor of 2.
- i. ... decreased by a factor of 2 and the resistance was increased by a factor of 2.

7. Use the Ohm's law equation to provide numerical answers to the following questions:

a. An electrical device with a resistance of $3.0\ \Omega$ will allow a current of 4.0 amps to flow through it if a voltage drop of _____ Volts is impressed across the device.

b. When a voltage of 120 V is impressed across an electric heater, a current of 10.0 amps will flow through the heater resistance is _____ Ω .

c. A flashlight that is powered by 3 Volts and uses a bulb with a resistance of $60\ \Omega$ will have a current of _____ Amps

8. Use the Ohm's law equation to determine the missing values in the following circuits.

Diagram A

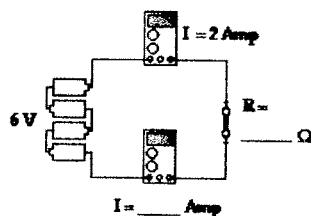


Diagram B

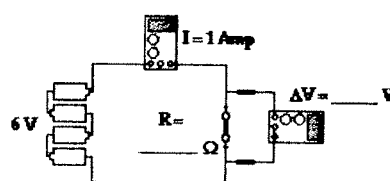


Diagram C

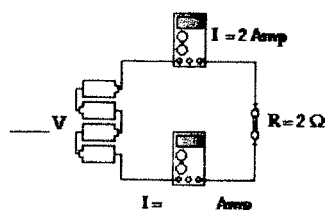


Diagram D

