Learning Intentions

- The relationship between voltage, current, and resistance in Ohm's Law.

Notes and Vocabulary

1. Ohm's Law:

    a. Materials that follow Ohm's Law are called _____.

    b. Materials that do not follow Ohm's Law are called _____.

2. Resistivity (of a material):

3. Electric power in a DC circuit:

    a. The power equation can be combined with Ohm's Law to only use current (I) and resistance (R)

    b. The power equation can also be combined with Ohm's Law to only use voltage (V) and resistance (R)

Questions

1. A speaker with a resistance of 8.0 Ω has a voltage of 40 V.
    a. How much current flows through the speaker?
    b. What is the speaker's power?
2. A power resistor uses 2.0 A of current while being powered by a 48 V battery.
    a. What is the resistance of the resistor?
    b. How much power does the resistor use?
3. A 0.250 W resistor has a resistance of 330 Ω. What is the maximum current that it can carry?
4. A light bulb has a power output of 4.0 W. If it operates on 5.0 V, how much current flows through it?
5. A DC motor is powered by a 12.0 V car battery, and draws 500 mA of current.
    a. What is the resistance of the motor?
    b. What is the power consumption of the motor?
6. An electric heater requires 20 W of electric power to run. If it runs on 6.0 V, what is its resistance?
7. A USB phone charger uses 5.0 V to charge the phone, and uses 10 W of power. How much current flows through the charger?

Answers

1. a. I = 5.0 A
   b. P = 200 W
2. a. R = 24 Ω
   b. P = 96 W
3. I = 0.028 A = 28 mA
4. I = 0.80 A = 800 mA
5. a. R = 24 Ω
   b. P = 6.0 W
6. R = 1.8 Ω
7. 2.0 A