

Section

19-1**HOLT PHYSICS****Concept Review***Electric Current*

1. The sphere of a Van de Graaff generator had 6.00 C of charge. When connected to the ground, it was discharged in 24.0 ms. What was the average discharge current?

2. The current through a light bulb in a flashlight is 0.750 A.

- a. How much charge passed through the filament

• in 20.0 s? _____

• in 5.00 min? _____

• in 2.00 h? _____

- b. How many electrons enter the filament every second?

- c. How many exited the filament every second?

- d. Where do the electrons entering the filament come from? Where do they go after exiting?

3. A battery supplies a 0.015 A current to a small radio. How long should the radio stay on so that 4.80 C passes through each of the following parts of the circuit:

- a. through the battery _____

- b. through the radio _____

- c. through the connecting wires _____

Section

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HOLT PHYSICS

Concept Review*Resistance*

- 1.** The label on a small heater specifies its electric performance as 115 V, 4.50 A.

a. What is the resistance of the heating filament in this heater?

b. How much current will it draw when connected to the following:

• 120 V _____

• 220 V _____

• 60.0 V _____

• 10.0 V _____

- 2.** Three resistors are available for testing a 9.00 V battery. Resistor A has 5.00 k Ω of resistance, resistor B has 5.00 Ω of resistance, and resistor C has 0.0500 Ω of resistance.

a. How much current will each resistor draw?

b. Which resistor is more useful for testing if the battery is dead? Explain.

- 3.** An electrical device of 37.2 Ω resistance performs best when the current is 3.62 A. How much voltage should be applied?

- 4.** An electronic device performs best with a 1.20 V battery, when the current is between 3.50 mA and 4.20 mA. What is the range of possible resistances for this electronic device?

Section

19-3**HOLT PHYSICS****Concept Review***Electric Power*

- 1.** A food processor draws 8.47 A of current when connected to a potential difference of 110 V.

a. What is the power consumed by this appliance?

b. How much electrical energy is consumed by this food processor monthly (30 days) if it is used on average of 10.0 min every day?

c. Assume that the price of electrical energy is 7.00 ¢/kWh. What is the monthly cost of using this food processor?

- 2.** The electric meter in a house indicates that the refrigerator consumes 70.0 kWh in a week.

a. What is the power consumption of the refrigerator?

b. Assuming it is connected to a potential difference of 120 V, how much current does the refrigerator draw?

- 3.** The heating element of an electric broiler dissipates 2.8 kW of power when connected to a potential difference of 120 V.

a. What is the resistance of the element?

b. How much current does the broiler draw? Use two ways to find out, and verify your answer.

Mixed Review*Current and Resistance*

1. A 60.0 cm metal wire draws 0.185 A from a 36.0 V battery. Will the current increase or decrease when the following changes are performed? Explain whether the change is due to a change in resistance, a change in potential difference, or other reasons.

a. The wire is cut into four pieces, and only one segment is used.

b. The wire is bent to form an *M* shape.

c. The wire is heated to 500°C.

d. The 36.0 V battery is replaced by a 24.0 V battery.

2. A 25 Ω resistance heater is connected to a potential difference of 120 V for 5.00 h.

a. How much current does the heater draw?

b. How much electric charge travels through the heating element during this time?

c. What is the power consumption of the heater?

d. Use the power and time to calculate how much energy was consumed.

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HOLT PHYSICS

Mixed Review *continued*

- 3.** The label on a three-way light bulb package specifies 100 W, 150 W, 250 W, 120 V.

- a.** How much current does the light bulb draw in each of the three ways?
(Assume three significant figures in each of these measurements.)

- b.** What is the bulb's resistance in each way?

- c.** Compare the cost of using the light bulb for 100.0 h in each way.
(Assume that the price is 7.00 ¢/kWh.)

- 4.** An electric hot plate draws 6.00 A of current when its resistance is 24.0 Ω .

- a.** What is the voltage across the hot plate's heating element?

- b.** How much power does it consume?

- c.** For what length of time should it be kept on in order to supply 9×10^4 J to a coffeepot? (Assume that all electrical energy is transferred to the coffeepot by heat.)
