Date _____ Period _____ Name _____

CHAPTER
22 Study Guide

Current Electricity

Vocabulary Review

Write the term that correctly completes the statement. Use each term once.

ampere	electric current	resistor
battery	kilowatt-hour	series connection
conventional current	parallel connection	superconductor
electric circuit	resistance	

1. _____ A(n) _____ is a material with zero resistance.
2. _____ The _____ of a wire determines how much current will flow through the wire when a voltage is applied.
3. _____ The _____ is the flow of charged particles.
4. _____ In a(n) _____, there is only one path for the current.
5. _____ A(n) _____ is a unit of energy.
6. _____ In a(n) _____, there is more than one path for the current.
7. _____ A(n) _____ is the unit of current.
8. _____ A(n) _____ is a closed loop in which electrons can move.
9. _____ A(n) _____ converts chemical energy to electrical energy.
10. _____ A(n) _____ is the flow of positive charge.
11. _____ A(n) _____ is a device designed to have a specific resistance.

Section 22.1 Current and Circuits

In your textbook, read about electric circuits on pages 591–593.

For each statement below, write true *or rewrite the italicized part to make the statement true.*

1. _____ *Negative* charge flows from a higher potential to a lower potential.
2. _____ The flow of *electrons* is called conventional current.

3. _____ The total charge passing through a point on a circuit is the current multiplied by the *time* the charge flows.

4. _____ Electrical energy is converted into kinetic energy in a *generator*.

5. _____ The number of *electrons* in a closed circuit does not change.

Write the term that correctly completes the statement.

A circuit includes a **(6)** _____, which increases the potential energy of the charge, and a device that **(7)** _____ the potential energy of the charge. The potential energy lost by the charges is usually converted into another form of **(8)** _____. For example, a lamp converts electrical energy to **(9)** _____ energy.

Read the passage below to answer questions 10–13.

A closed circuit consists of a battery of constant voltage connected to a heater with wires. Electrons are flowing through the circuit, causing the heater to emit thermal energy.

10. Draw a sketch of the circuit.

11. What do the battery and the heater do to the electrons?

_____

_____

_____

12. What does the law of conservation of electric charge state?

_____

13. Is it possible for the current leaving the heater to be different than the current entering the heater? Why or why not?

_____

_____

_____

In your textbook, read about rates of charge flow and energy transfer on pages 593–594.
Circle the letter of the choice that best completes the statement.

14. Power is measured in units called _____.

a. amperes
c. kilowatt-hours
b. joules
d. watts

15. Current is measured in units called _____.

a. amperes
c. potential
b. kilowatt-hours
d. watts

16. If a 9.0-V battery delivers 0.50 A of current to a heater, the power consumed by the heater is _____.

a. 0.056 W
c. 9.0 W
b. 4.5 W
d. 18 W

17. If a light bulb is rated at 50 W, the amount of energy consumed in 30 minutes is _____.

a. 2 kWh
c. 30 J
b. 30 kWh
d. 90,000 J

Write the term that correctly completes the statement.

(18) _____ measures the rate at which energy is transferred. The formula for the power is **(19)** _____. The energy carried by an electric current depends on the **(20)** _____ transferred and the **(21)** _____ difference the charge undergoes. The formula for the amount of energy transferred is **(22)** _____. The rate of flow of the charge is called the electric **(23)** _____. The formula for the rate of flow of charge is **(24)** _____. Another formula for the power delivered by an electric current is **(25)** _____.

In your textbook, read about resistance and Ohm's law on pages 595–597.
Circle the letter of the choice that best completes the statement.

26. A battery with a voltage of 9.0 V is connected to a lamp. The current flowing in the circuit is 0.30 A. The resistance of the lamp is _____.

a. 0.030 Ω
c. 27 Ω
b. 2.7 Ω
d. 30 Ω

27. For a wire that obeys Ohm's law, the resistance of a wire depends on the _____ the wire.

a. current in

b. length of

c. power delivered by

d. voltage across

28. If a 200-Ω resistor is connected to a 5-V battery, the current in the circuit will be _____.

a. 0.025 A

b. 2.5 A

c. 40 A

d. 1000 A

29. A device that can be used to change the current in a circuit in a continuous way is a _____.

a. potentiometer

b. battery

c. motor

d. lamp

Answer the following questions.

30. Draw a circuit diagram with a resistor, ammeter, and battery. Connect the ammeter in series with the other two components.

31. Draw a circuit diagram with a resistor, battery, and voltmeter. Connect the voltmeter in parallel across the resistor. Draw another circuit diagram showing the voltmeter connected in parallel across the battery.