Concept Review: Electrical Current Ch. 15

Name _____

Period _____

Chapter 15: Electric Current & Ohm's Law

1. What condition is necessary for the sustained flow of water in a pipe? What analogous condition is necessary for the sustained flow of charge in a wire?

2. What is electric current?

3. What is an ampere?

4. What is voltage?

5. How many joules per coulomb are given to charges that flow in a 120-volt circuit?

6. Does charge flow through a circuit or into a circuit?

7. Does voltage flow through a circuit, or is voltage established across a circuit?

8. What is electric resistance?

9. Is electric resistance greater in a short fat wire or a long thin wire?

10. What is Ohm's law?

11. If the voltage impressed across a circuit is constant but the resistance doubles, what change occurs in the current?

12. If the resistance of a circuit remains constant while the voltage across the circuit decreases to half its former value, what change occurs in the current?

13. Why is it that a bird can perch without harm on a high voltage wire?

14. What is the function of the third prong in a household electric plug?

15. What is power?

16. Which of these is a unit of power and which is a unit of electrical energy: a watt, a kilowatt, and a kilowatt-hour?

17. How many amperes flow through a 60-watt bulb when 120 volts are impressed across it?

18. How much charge flows in a pocket calculator each minute when the current is 0.0001 ampere?

19. Calculate the current of a lightning bolt that delivers a charge of 35 coulombs to the ground in a time of 1/1000 second.

20. A motor with an operating resistance of 32 ohms is connected to a voltage source. The current I the circuit is 3.8 A. What is the voltage of the source

21. How much current moves through your fingers (resistance: 1200 ohms) if you touch them to the terminals of a 6-volt battery?

22. Calculate the resistance of the filament in a lightbulb that carries 0.4 A when 3.0 V is impressed across it.

23. Calculate the current in a 140-W electric blanket connected to a 120-V outlet.

24. Distinguish between DC and AC. Which is produced by a battery and which is usually produced by a generator?

25. From where do the electrons originate that flow in a typical electric circuit?

26. How much voltage is required to make 2 amperes flow through a resistance of 8 ohms?

27. A battery does 18 joules of work on 3 coulombs of charge. What voltage does is supply?

28. Use the relationship power = current · voltage to find out how much current is drawn by a 1200-watt hair dryer when it operates on 120 volts. Then use Ohm's law to find the resistance of the hair dryer.

29. The wattage marked on a lightbulb is not an inherent property of the bulb but depends on the amount of voltage to which it is connected, usually 110 V or 120 V. Calculate the current through a 40-W bulb connected to 120 V.

30. An 8 amp electric heater operates on a 120-V outlet.

a. What is the power of the device?

b. Calculate the energy used for 4 hours.

c. Calculate the cost to operate the electric heater if the cost per kilowatt-hour is 8 cents.