

Chapter 17

Electrical Principles



Name _____

Date _____

Instructor _____

Score _____

Objective: After studying this chapter, you will be able to describe the parts of the atom and explain the principles of electricity.

Atomic Structure

For questions 1–5, match the following terms and identifying phrases.

- | | | |
|-------|--|--------------|
| _____ | 1. A substance composed of molecules containing two or more elements. | (A) Matter |
| _____ | 2. A group of one type of atom. | (B) Atom |
| _____ | 3. A microscopic particle that cannot be broken into smaller pieces without losing its properties. | (C) Element |
| _____ | 4. Anything in the universe that occupies space and has mass (weight). | (D) Molecule |
| _____ | 5. A group of two or more atoms joined together. | (E) Compound |
6. The three parts of an atom are _____, _____, and _____. _____

Electricity

7. Movement of free electrons is the result of _____ and _____ charges between atoms. _____

8. Define *electricity*. _____

9. If a wire has a negative charge on one end and a positive charge on the other end, _____ will result. _____
10. A(n) _____ is a substance that allows the flow of free electrons. _____
11. A (n) _____ is a substance that resists the flow of free electrons. _____

12. Name three basic functions of electricity.

13. Electrical devices can do the job of mechanical devices _____
(more, less) _____ quickly and efficiently.

14. When a component uses less than one or two volts for _____
operation, it is _____.

15. A(n) _____ is a conventional component that uses _____
electricity to do work.

Magnetism

16. Magnetism is an atomic _____ that can attract or repel _____
ferrous (iron-containing) substances through space, air,
or solid matter.

17. Like charges _____ each other. _____

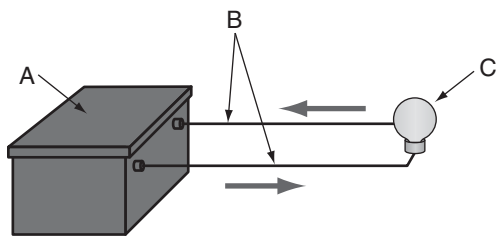
18. Unlike charges _____ each other. _____

19. Define *electromagnetism*.

20. What is the process of creating electricity in a wire by passing the wire through a magnetic field?

Electric Circuits

21. Identify the parts of the simple circuit illustrated below.



(A) _____

(B) _____

(C) _____

22. Describe and explain the three fundamental properties of electrical circuits.

Name _____

Conventional and Electron Theories

23. According to conventional current theory, electrons flow from (positive, negative) _____ to (positive, negative) _____.
24. According to electron flow theory, electrons flow from (positive, negative) _____ to (positive, negative) _____.

Direct and Alternating Current

25. Define *direct current (dc)* and *alternating current (ac)*.

26. _____ is the number of cycles per second, or _____.