Chapter 18

Circuit Types and Ohm's Law

Name _____ Date _____

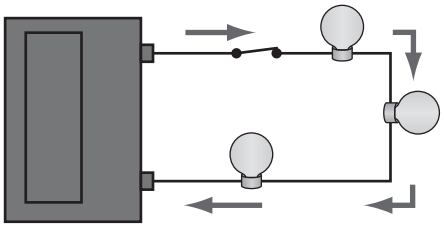
Instructor _____ Score _____

Objective: After studying this chapter, you will be able to compare the operating characteristics of series, parallel, and series-parallel circuits and explain the operation of a frame-ground circuit.

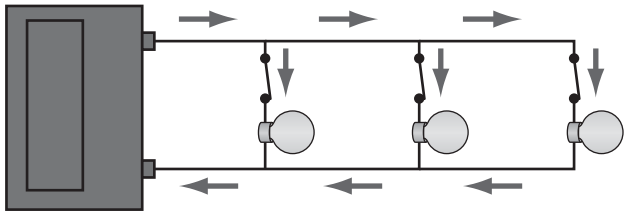
Circuit Types

1. A(n) _____ is a closed electrical path for current. _____

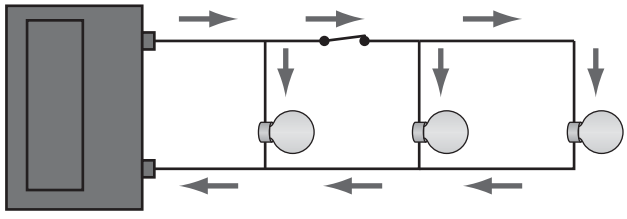
2. Identify the circuit types illustrated below.



A



B



C

(A) _____

(B) _____

(C) _____

3. A(n) _____ circuit has only one path for current. _____

4. If a string of lights is wired in _____, one burned-out bulb will not affect the operation of the other bulbs in the circuit. _____

_____ 5. A frame-ground circuit uses the vehicle's _____ to return electricity to the power source.
   (A) metal structure
   (B) windshield
   (C) electrical system
   (D) tires

6. Explain *conventional current theory*.

_____

_____

_____

7. Which battery cable is bolted to the vehicle frame to allow the metal structure of the vehicle to serve as a large conductor to carry current?

_____

8. The wire that carries current to the load is the _____ wire. _____

9. The _____ is the part of the circuit between the load and the negative terminal of the battery. _____

Ohm's Law

10. Define *Ohm's law*.

_____

_____

11. Name the three formulas that represent Ohm's law.

_____

_____

_____

_____

_____

_____

_____

_____ 12. A change in _____ affects the amount of current in a circuit.
   (A) resistance
   (B) voltage
   (C) Both A and B.
   (D) None of the above.

13. Most automotive electrical problems are caused by a change in circuit _____. _____

Name _____

Circuit Calculations

14. Name the three general rules that apply to a series circuit.

_____

_____

_____

_____

_____

15. Name the three basic rules of parallel circuit calculations.

_____

_____

_____

_____

_____

16. The _____ of a number equals 1 divided by that number. _____

17. In a series-parallel circuit, you can find the total resistance of the circuit by calculating the resistance of each parallel section and then adding the series resistances to these values to obtain a single _____ resistance. _____

_____ 18. The unit of measure for electric power is the _____.
- (A) amp
- (B) volt
- (C) watt
- (D) ohm

19. What is the formula for power?

_____

_____

_____ 20. Power ratings for hybrid motor-generators and HV batteries can be given in _____.
- (A) amps
- (B) volts
- (C) ohms
- (D) kilowatts

21. Vehicle batteries may have a watt rating to indicate their _____ potential. _____

22. To avoid having to read and write large numbers representing electrical values, _____ are used with these values to indicate a multiplier, or exponent, of the value. _____

23. One _____ equals 1000 Ω. _____

24. How many ohms are indicated by 5 MΩ?

_____

_____ 25. Which of the following is *not* one of the most commonly used prefixes in automotive electronics?
(A) milli
(B) exa
(C) kilo
(D) micro