Chapter 22

Basic Electrical Tests

Name _____ Date _____

Instructor _____ Score _____

Objective: After studying this chapter, you will be able to use a systematic approach to find and correct electrical problems and explain causes of basic circuit problems given their symptoms.

Electrical Diagnosis and Repair

1. _____ involves using a logical sequence of steps to find the source of an electrical problem.

   _____

2. Due to the complexity of the electronic devices and electrical circuits in late-model vehicles, a(n) _____ approach to troubleshooting should never be used.

   _____

3. Describe the systematic approach to troubleshooting.

   _____

   _____

   _____

   _____

4. What questions should you ask when verifying symptoms of a vehicle?

   _____

   _____

   _____

   _____

   _____

5. If the right headlight is not working but the left one is working, what should you check?

   _____

   _____

6. If only one component does not work, where should you start your tests?

   _____

   _____

7. If more than one component does not work, where should you start your tests?

_____

_____

Types of Circuit Problems

8. What are the four basic types of circuit problems?

_____

_____

_____

_____

For questions 9–12, match the following terms and identifying phrases.

_____ 9. A conductor accidentally touching ground or another conductor.

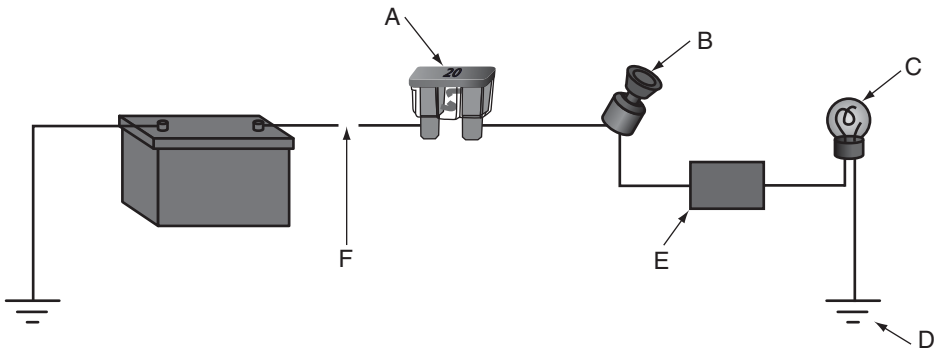
_____ 10. Occurs only under certain conditions.

_____ 11. A complete break or disconnection in the circuit.

_____ 12. Reduces, but does not stop, current.

(A) Open circuit
(B) High circuit resistance
(C) Intermittent problem
(D) Short circuit

13. Identify the sources of opens and breaks in the circuit shown.



(A) _____ (D) _____

(B) _____ (E) _____

(C) _____ (F) _____

Using Test Devices

14. A(n) _____ is a piece of wire with alligator clips used to bypass components or to apply voltage to a component or section of a circuit. _____

15. (Never, Always) _____ use a jumper wire to bypass a high-resistance component, a fuse, or a circuit breaker. _____

16. Most test lights have a sharp _____ for touching conductors and an alligator clip for grounding. _____

Name _____

17. A self-powered test light, or continuity tester, has an internal _____. _____

18. An inductive wire tracer uses a(n) _____ and an inductive pickup to find shorts. _____

Using a Multimeter

19. Define *multimeter*.

_____

_____

_____

20. Describe what a multimeter does.

_____

_____

_____

For questions 21–23, match the following terms and identifying phrases.

(A) Voltmeter
(B) Ohmmeter
(C) Ammeter

_____ 21. Measures current.

_____ 22. Measures electrical pressure.

_____ 23. Measures resistance to current.

24. Most digital meters are _____, meaning that they automatically change to the correct scale. _____

25. To avoid blowing a fuse in the ammeter, make sure the possible amp reading is _____ the rating of the ammeter. _____

26. The bar graph on a digital-analog multimeter serves as a(n) _____ display that can show rapid changes in readings. _____

27. A fully charged 12-volt battery should have _____ volts. _____

28. A voltage drop measurement determines the _____ of a wire or component. _____

29. What is the benefit of using a voltage drop measurement?

_____

_____

_____

_____

_____

30. What does infinite resistance mean?

_____

_____

_____

31. A perfect electrical path that exists between the test points means _____ resistance. _____

32. A problem producing a drag on the motor, such as bad armature bearings or a short in a winding, suggests (low, high) _____ current draw. _____

33. Burned motor brushes, poor terminal connections, or a bad ground suggests (low, high) _____ current draw. _____

34. Name three rules to follow when using multimeters.

_____

_____

_____

_____

_____

_____

_____

Basic Component Tests

35. A (good, bad) _____ connector has little or no resistance across its terminals. _____

36. A(n) _____ can be used to check for power on both sides of a connector. _____

37. A good variable resistor should exhibit a (fast, slow, gradual) _____ change in resistance as you turn its shaft or move its slide. _____

_____ 38. A switch can be tested by using a(n):
(A) test light
(B) voltmeter
(C) ohmmeter
(D) All of the above.

39. Give two examples of a transducer switch.

_____

_____

_____

Name _____

_____ 40. A(n) _____ is normally used to check a temperature switch because the leads to the switch can be disconnected easily.
(A) test light
(B) voltmeter
(C) ohmmeter
(D) Any of the above.

41. A quick way of checking a temperature switch and its circuit is to _____ it. _____

_____ 42. A fuse can be checked using a(n) _____.
(A) test light
(B) voltmeter
(C) ohmmeter
(D) Both A & B.

43. If a fuse is blown, you should check for a(n) _____. _____

44. Why are capacitors used?

_____

_____

_____

_____

_____ 45. A capacitor can be tested using a(n) _____.
(A) test light
(B) voltmeter
(C) ohmmeter
(D) Both A & B.

46. When using an ohmmeter for testing, a diode should have _____ resistance in one direction and _____ resistance in the other. _____ _____

47. _____ can be used to clean oil and grease from components before soldering. _____

48. _____ can be used to find intermittent problems in electronic components. _____