

Chapter 01: Classroom Manual: Introduction to Automotive Electrical and Electronic Systems

1. A charging system is used to restore electrical power to the battery that was used during engine starting.

- a. True
- b. False

ANSWER: True

2. Today, most vehicle manufacturers network their electrical systems through computers.

- a. True
- b. False

ANSWER: True

3. A neutral safety switch is used on vehicles with automatic transmissions.

- a. True
- b. False

ANSWER: True

4. The vehicle lighting system only includes the lights on the exterior of the vehicle.

- a. True
- b. False

ANSWER: False

5. The vehicle instrumentation systems monitor various vehicle operating systems.

- a. True
- b. False

ANSWER: True

6. Power mirrors are considered an electrical accessory.

- a. True
- b. False

ANSWER: True

7. Most vehicles today contain one powerful on-board computer.

- a. True
- b. False

ANSWER: False

8. The use of automatic passive restraint systems is federally mandated on all passenger vehicles sold in the United States after 1990.

- a. True
- b. False

ANSWER: True

9. Multiplexing means to use several modules to control a system.

- a. True
- b. False

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ANSWER:

False

10. Horns operate on the principle of heat.

- a. True
- b. False

ANSWER:

False

11. Today there are very few electrical systems that are still ____.

- a. networked
- b. battery operated
- c. independent
- d. complex

ANSWER:

c

12. Which of the following components controls the output voltage of the AC generator, based on charging system demands, by controlling field current?

- a. starter relay
- b. ignition switch
- c. current generator
- d. voltage regulator

ANSWER:

d

13. Which system converts the mechanical energy of the engine into electrical energy to recharge the battery and run the electrical accessories?

- a. battery
- b. charging
- c. computer
- d. electrical

ANSWER:

b

14. Which vehicle system monitors the various vehicle operating systems and provides information to the driver about their correct operation?

- a. charging
- b. lighting
- c. power
- d. instrumentation

ANSWER:

d

15. Rear window defoggers heat the glass using the principle of ____.

- a. controlled resistance
- b. infinite resistance
- c. alternating current
- d. multiplexing

ANSWER:

a

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16. Which electronic device stores and processes data and is capable of operating other devices?

- a. master control switch
- b. computer
- c. assembler
- d. control module

ANSWER:

b

17. Since 1990, federal regulations have mandated that all vehicles sold in the United States use:

- a. transmissions
- b. steering systems
- c. passive restraint systems
- d. diagnostic modules

ANSWER:

c

18. Similar to an electric vehicle, a fuel-cell-powered vehicle supplies torque to the drive wheels using a(n) ____.

- a. battery
- b. compressor
- c. MUX wiring system
- d. electric motor

ANSWER:

d

19. Technician A says that most manufacturers use stand-alone electrical systems on modern vehicles. Technician B says that in a networked system a fault in one component may cause several symptoms. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

ANSWER:

b

20. Technician A says the basic starting system includes a MUX capacitor. Technician B says the basic starting system includes the vehicle battery. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

ANSWER:

b

21. Technician A says the neutral safety switch is used on vehicles with automatic transmissions. Technician B says the neutral safety switch is used on vehicles with manual transmissions. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

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ANSWER:

a

22. Technician A says most manufacturers now use a system of vehicle communications called multiplexing. Technician B says multiplexing allows control modules to share information. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

ANSWER:

c

23. Alternate propulsion vehicle systems may include all of the following except:

- a. Fuel cell vehicles
- b. Hydroelectric vehicles
- c. Hybrid vehicles
- d. Electric vehicles

ANSWER:

b

24. What best describes the way an automotive horn operates?

- a. Frequency modulation
- b. Induced voltage
- c. A vibrating column of air
- d. Depleting zone bonding

ANSWER:

c

25. All of the following statements about an air bag system are true *EXCEPT*:

- a. Deployment is automatic
- b. It is a supplemental system
- c. It is mandated by the federal government
- d. It is not a passive system

ANSWER:

d

26. The purpose of the vehicle multiplex system is to:

- a. Allow computers to share information
- b. Prevent electromagnetic interference
- c. Prevent multiple system failures
- d. Increase circuit loads to a sensor

ANSWER:

a

27. All of the following are true of the easy exit feature of memory seat systems *EXCEPT*:

- a. The system may move the steering wheel up.
- b. It is an additional function on memory seat systems.
- c. The driver's door is opened automatically.
- d. The seat is moved all the way down and back when the vehicle is placed in park.

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ANSWER:

c

28. Technician A says federal regulations require that all lighting systems on an automobile must function the same way. Technician B says lighting systems are rarely similar on various vehicles. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

ANSWER:

d

29. Technician A says it is unlawful for automotive manufacturers to use computers to operate the lighting system. Technician B says computer-controlled lighting systems allow advanced features and improvements. Who is correct?

- a. A only
- b. B only
- c. Both A and B
- d. Neither A nor B

ANSWER:

b

30. Which of the following is a true statement?

- a. Electrical accessories provide additional safety and comfort.
- b. The lighting system consists of all the lights used on the vehicle.
- c. Antitheft systems are deterrent systems designed to scare off would-be thieves by sounding alarms and/or disabling the ignition system.
- d. All of the above.

ANSWER:

d

31. What type of vehicle uses both an electric motor and an internal combustion engine?

ANSWER: A hybrid electric vehicle.

32. What type of restraints operate automatically with no action required by the driver or occupants of a vehicle?

ANSWER: Passive restraint systems.

33. What system monitors the various operating systems and provide information to the driver about their operation?

ANSWER: The vehicle instrumentation system.

34. An easy exit feature is an additional function of what accessory system?

ANSWER: Memory seat system.

35. A computer is a device that performs what role as it relates to data?

ANSWER: It stores and processes data.

36. What term is used for the transportation of data from one module to another?

ANSWER: Data bus or multiplexing.

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37. Explain the basics of HEV operation.

ANSWER: During normal driving the engine is the main power source.
During stops and light acceleration the electric motor moves the vehicle.

38. What is the purpose of the keyless entry system?

ANSWER: To allow the driver to unlock the doors remotely without the key.

39. List some features of keyless entry.

ANSWER: Keyless entry systems may feature remote starting and keyless starting in addition to locking and unlocking the doors.

40. List the common components of the antitheft system.

ANSWER: The control module, door switches, trunk key switch, hood switch, starter inhibitor relay, horn relay, alarm, and exterior lights.

41. What areas have the use of computers in automotive electrical systems?

ANSWER: The use of computers on automobiles has expanded to include control and operation of several functions, including climate control, lighting circuits, cruise control, antilock braking, electronic suspension systems, and electronic shift transmissions.

42. The charging system serves what purpose on an automobile?

ANSWER: The charging system is used to restore to the battery the electrical power that was used during engine starting and to supply power to the electrical load demands of all the electronic vehicle systems.

43. What are passive restraint systems and what are the federal regulations which apply to them?

ANSWER: Passive restraints operate automatically, with no action required on the part of the driver or occupant. Federal regulations have mandated the use of automatic passive restraint systems in all vehicles sold in the United States after 1990.

44. What is the function of the memory seat system?

ANSWER: The memory seat system features allow the driver to program different seat positions that can be recalled at the push of a button and generally include an easy exit feature.

45. Explain the difference between an electric vehicle and a fuel-cell vehicle.

ANSWER: Electric vehicles powered by an electric motor run off a battery pack.
A fuel cell powered vehicle is basically the same as the electric vehicle except a fuel cell produces and supplies electric power to the electric motor instead of a battery pack.