

# ASE Electrical and Electronic Systems (A6) Practice Test (Sample)

## Study Guide



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**SAMPLE**

## Questions

- 1. How do you identify the wire size needed for a specific circuit?**
  - A. By consulting a mechanic**
  - B. Based on vehicle color codes**
  - C. Using gauge charts for current load and run length**
  - D. Following brand specifications only**
- 2. What does the term "ground" refer to in automotive electrical systems?**
  - A. A high voltage point in the circuit**
  - B. A common return path for electric current**
  - C. Any exposed wire in the system**
  - D. A place to connect additional batteries**
- 3. What is a common reason for flickering dashboard lights?**
  - A. A failing alternator**
  - B. Low oil levels**
  - C. Dirt on the windshield**
  - D. Excess tire pressure**
- 4. What should not be done when using a digital ohmmeter?**
  - A. Check resistance with voltage applied**
  - B. Zero the meter before testing**
  - C. Test continuity of leads**
  - D. Connect to voltage sources**
- 5. What does in-circuit testing involve?**
  - A. Testing components after they are removed from the circuit**
  - B. Testing while components are still connected in the system**
  - C. Using a multimeter only outside the circuit**
  - D. Visual checks of wiring without applying power**

- 6. What is the significance of the color code on automotive wiring?**
- A. Indicates the year of manufacture**
  - B. Helps identify function and circuit connections**
  - C. Determines the gauge of the wire**
  - D. Shows the maximum voltage rating**
- 7. What can a careful use of a test light determine?**
- A. The condition of a throttle position sensor**
  - B. The overall battery charge**
  - C. Wiring integrity**
  - D. Headlight current flow**
- 8. What type of flux should be used when soldering electrical wiring connections?**
- A. Rosin core flux**
  - B. Acid core flux**
  - C. Sulfur core flux**
  - D. None of the above**
- 9. Which of the following would not likely prevent all doors from unlocking using remote keyless entry?**
- A. A weak transmitter battery**
  - B. A bad passenger's door lock motor**
  - C. Interference from a radio transmitter**
  - D. A blown circuit breaker**
- 10. How can checking continuity assist in troubleshooting?**
- A. It improves fuel efficiency**
  - B. It verifies that current can flow through a circuit**
  - C. It decreases battery charge time**
  - D. It reduces engine noise**

## **Answers**

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1. C
2. B
3. A
4. A
5. B
6. B
7. D
8. A
9. B
10. B

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## **Explanations**

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**1. How do you identify the wire size needed for a specific circuit?**

**A. By consulting a mechanic**

**B. Based on vehicle color codes**

**C. Using gauge charts for current load and run length**

**D. Following brand specifications only**

To identify the wire size needed for a specific circuit, it is essential to use gauge charts that provide guidance based on the current load and the length of the wire run. These charts take into account the amount of electrical current that will flow through the wire and how far it must travel. This is crucial because wires can heat up and cause potential safety hazards if they are not appropriately sized for the load they carry or the distance they cover. Using gauge charts ensures that you select a wire with sufficient ampacity, which is the maximum amount of electric current a conductor or device can carry before sustaining immediate or progressive deterioration. This approach is a standard practice in electrical installations to comply with safety regulations and to ensure reliable circuit performance. Consulting a mechanic or strictly following brand specifications might not provide the necessary information regarding wire sizing, as they do not focus on the technical requirements for electrical load and distance. Similarly, vehicle color codes are often related to wiring identification and function rather than wire gauge specifications.

**2. What does the term "ground" refer to in automotive electrical systems?**

**A. A high voltage point in the circuit**

**B. A common return path for electric current**

**C. Any exposed wire in the system**

**D. A place to connect additional batteries**

In automotive electrical systems, the term "ground" refers to a common return path for electric current. This is essential for completing the electrical circuit, allowing current to flow back to the battery or the source after passing through various components such as switches, sensors, or motors. The ground serves as a reference point for the entire electrical system, providing a stable voltage level and enhancing safety by preventing high voltage on exposed parts of the system. The concept of grounding helps in reducing electrical noise and ensuring proper functioning of all electrical components by providing a safe route for fault currents, which can occur during electrical malfunctions. Thus, the ground is integral to the overall reliability and functionality of automotive electrical systems.

### 3. What is a common reason for flickering dashboard lights?

- A. A failing alternator**
- B. Low oil levels**
- C. Dirt on the windshield**
- D. Excess tire pressure**

A common reason for flickering dashboard lights is a failing alternator. The alternator is responsible for charging the battery and supplying power to the electrical systems in the vehicle while the engine is running. If the alternator is malfunctioning, it may not be providing a consistent voltage output, which can cause the dashboard lights to flicker as the electrical system experiences fluctuations in power. This situation typically occurs when the alternator's internal components, such as the voltage regulator, are wearing out or if there are issues with the alternator's connection to the battery or the wiring harness. As a result, insufficient power can reach the dashboard instruments, leading to the flickering effect. In contrast, low oil levels, dirt on the windshield, and excess tire pressure would not contribute to flickering dashboard lights, as these conditions do not affect the electrical system directly. Each of these factors may lead to other types of operational issues in a vehicle, but they do not create the electrical irregularities responsible for flickering lights on the dashboard.

### 4. What should not be done when using a digital ohmmeter?

- A. Check resistance with voltage applied**
- B. Zero the meter before testing**
- C. Test continuity of leads**
- D. Connect to voltage sources**

When using a digital ohmmeter to check resistance, it is crucial not to apply voltage to the circuit being tested. Digital ohmmeters work by sending a small current through the resistance of the component or circuit to measure its resistance value. If voltage is present, it can cause inaccurate readings, damage the ohmmeter, or lead to potential safety hazards. When measuring resistance, the circuit should be de-energized to ensure that the ohmmeter functions correctly without interference from external voltage sources. This is essential for achieving reliable measurements and protecting the integrity of both the testing equipment and the circuit being analyzed. The other actions, such as zeroing the meter before testing, testing continuity of leads, and ensuring that connections are secure, are standard practices that enhance accuracy and reliability in measurements.

## 5. What does in-circuit testing involve?

- A. Testing components after they are removed from the circuit
- B. Testing while components are still connected in the system**
- C. Using a multimeter only outside the circuit
- D. Visual checks of wiring without applying power

In-circuit testing involves evaluating the performance and condition of electronic components while they remain connected within a functioning circuit. This method allows for the detection of issues such as short circuits, open circuits, and incorrect component values without the need to desolder or remove components from the board. By testing in-circuit, technicians can assess the live state of the circuit, ensuring all connections and components are operational under actual working conditions. This is particularly effective because faults may reveal themselves only when the circuit is powered and functioning. Therefore, in-circuit testing provides a comprehensive assessment of the system's reliability and performance.

## 6. What is the significance of the color code on automotive wiring?

- A. Indicates the year of manufacture
- B. Helps identify function and circuit connections**
- C. Determines the gauge of the wire
- D. Shows the maximum voltage rating

The significance of the color code on automotive wiring lies in its ability to help identify the function and circuit connections of each wire. Different colors correspond to specific tasks, such as power supply, ground, or signal transmission. This coding system allows technicians and mechanics to quickly understand the wiring harness, ensuring proper connections and aiding in troubleshooting. By following the color code, one can determine where each wire leads and its purpose in the vehicle's electrical system, which is essential for both repairs and modifications. In contrast, while the year of manufacture, wire gauge, and maximum voltage rating are important aspects to consider in automotive electrical systems, they are not represented by the color coding of the wires themselves. The color code is specifically designed to convey functional information rather than specifications related to manufacture or physical attributes of the wire.

## 7. What can a careful use of a test light determine?

- A. The condition of a throttle position sensor
- B. The overall battery charge
- C. Wiring integrity
- D. Headlight current flow**

A test light is a simple yet effective tool used in automotive diagnostics to determine whether voltage is present in a circuit. When it comes to assessing headlight current flow, using a test light can confirm if the circuit is completing as it should. By connecting the test light in series with the headlight circuit, you can observe whether current is able to flow through the circuit, indicating that the headlight is functional and the associated wiring and connections are intact. This approach is particularly useful for identifying issues such as burnt-out bulbs, faulty connections, or broken wires, as the test light will illuminate when a complete circuit exists. If the test light does not illuminate while testing the headlight circuit, it reveals that there is likely a problem preventing current flow, thus guiding further diagnosis. In contrast, while the other options may require more complex diagnostic tools or methods to assess their conditions, the test light is specifically designed to quickly check for current flow in straightforward electrical circuits.

## 8. What type of flux should be used when soldering electrical wiring connections?

- A. Rosin core flux**
- B. Acid core flux
- C. Sulfur core flux
- D. None of the above

When soldering electrical wiring connections, rosin core flux is the appropriate choice. This type of flux is specifically designed for electrical applications, as it is non-corrosive and safe for use on electronic components. The rosin helps to clean the metal surfaces being joined and improves the flow of solder during the process, ensuring a strong and reliable connection. Using rosin core flux allows for efficient heat transfer and helps prevent oxidation, which can interfere with soldering. The non-corrosive nature of rosin means that it will not damage the wiring or components after the soldering process is complete, making it ideal for electrical work. In contrast, acid core flux is typically used in plumbing applications because it can be corrosive to electronic components and wires, leading to potential damage over time. Sulfur core flux, while useful in some metalwork applications, is also not suitable for electronics due to its corrosive properties. Therefore, the choice of rosin core flux aligns with the best practices for ensuring the longevity and integrity of electrical connections.

**9. Which of the following would not likely prevent all doors from unlocking using remote keyless entry?**

- A. A weak transmitter battery**
- B. A bad passenger's door lock motor**
- C. Interference from a radio transmitter**
- D. A blown circuit breaker**

The scenario presented in the question assesses factors affecting the performance of a remote keyless entry system. The option indicating a bad passenger's door lock motor is not likely to prevent all doors from unlocking because the remote keyless entry system typically activates all doors simultaneously through a centralized locking control. If one specific door lock motor is faulty, it may prevent that particular door from unlocking, but it would not affect the locking mechanism for the entire system. In contrast, a weak battery in the transmitter could diminish the signal strength, resulting in the system not responding. Interference from another radio transmitter could disrupt the signal entirely, affecting all doors. A blown circuit breaker would cut off electrical power to essential components involved in the unlocking process, preventing all doors from responding to the remote signal. Therefore, the passenger's door lock motor, being a localized issue, would not result in a total failure of the remote keyless entry system.

**10. How can checking continuity assist in troubleshooting?**

- A. It improves fuel efficiency**
- B. It verifies that current can flow through a circuit**
- C. It decreases battery charge time**
- D. It reduces engine noise**

Checking continuity is a crucial step in troubleshooting electrical circuits, and verifying that current can flow through a circuit directly addresses this need. When a technician checks for continuity, they are essentially determining whether there is a complete path for electricity to travel. A test for continuity will indicate whether there are any breaks, shorts, or faults in the wiring or components. If current cannot flow due to an open circuit, the technician can identify the issue and take corrective measures. This process is especially important in troubleshooting various electrical components in a vehicle, such as sensors, actuators, and wiring harnesses. If continuity is confirmed, it suggests that the component and the associated wiring are functioning properly, allowing for further diagnostics to focus on other potential issues. Since ensuring a proper flow of current is fundamental for the operation of almost every electrical system, verifying continuity is essential for effective troubleshooting and repair.