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Practice Questions

Try all 30 first, then check the answer key at the back.

1. When diagnosing a circuit with a blown fuse, which of these tools is MOST effective for finding the short to ground?

A. Test light
B. Battery load tester
C. Scan tool
D. Digital multimeter (ohms)

2. A truck's dash lights flicker intermittently while driving. Technician A says this could be caused by a loose battery connection. Technician B says this could be caused by a faulty alternator. Who is right?

A. B only
B. Neither A nor B
C. Both A and B
D. A only

3. What is the proper way to measure voltage drop across a switch in a circuit?

A. Connect one lead to ground and one lead to the switch
B. Place meter leads on both sides of the switch with the circuit energized
C. Place meter leads across the switch with the circuit off
D. Connect one lead to battery positive and one lead to the switch

4. When testing a truck that has a parasitic draw of 2.5 amps, what is the BEST next step?

A. Pull fuses one at a time while monitoring amperage
B. Replace the battery
C. Replace the alternator
D. Disconnect the negative battery cable when parked

5. When diagnosing an open circuit, a technician connects one lead of an ohmmeter to one end of the circuit and the other lead to the opposite end. The meter reads OL (infinite resistance). What does this indicate?

A. The circuit has a short to ground
B. The circuit has a short to power
C. The circuit has normal resistance
D. There is an open somewhere in the circuit

6. What is the correct way to test a relay using a digital multimeter?

A. Check for shorts between all terminals
B. Measure voltage drop across the relay
C. Check coil resistance and test continuity of contacts
D. Apply power to the relay and measure current draw

7. A truck's warning chime doesn't sound when the key is left in the ignition with the driver's door open. Using a wiring diagram, a technician determines that the circuit includes a door switch, ignition switch, and control module. What is the FIRST step in diagnosing this problem?

A. Reprogram the control module
B. Test the door switch for proper operation
C. Replace the chime module
D. Check for battery voltage at the ignition switch

8. When reading a wiring diagram, a wire is labeled "BRN/WHT 141." What does this typically indicate?

A. A brown wire with white stripe, circuit number 141
B. A brown wire connected to white wire, connection point 141
C. A white wire with brown stripe, 14 gauge, circuit 1
D. A brown/white twisted pair, 14 gauge, with 1 ohm resistance

9. A technician is diagnosing a multiplexed data network issue on a truck. The diagnostic tool shows communication with some modules but not others. What is the MOST likely cause?

A. Faulty diagnostic tool
B. Low battery voltage
C. Corrupted software in all modules
D. Open circuit in the data bus wiring

10. A circuit protected by a 10-amp fuse keeps blowing the fuse when operated. After replacing several fuses, what should be measured FIRST to diagnose the problem?

A. Supply voltage with a voltmeter
B. Ground voltage with a voltmeter
C. Circuit current draw with an ammeter
D. Circuit resistance with an ohmmeter

11. When using a voltmeter to perform a voltage drop test across a ground connection, what reading would indicate a problem?

A. Exactly 0 volts
B. Greater than 0.1 volts
C. Less than 0.1 volts
D. Exactly 12 volts

12. A truck's electronic control module (ECM) sets a code for an open circuit on a sensor input. Which tool would be BEST for testing the wiring between the sensor and the ECM?

A. Digital multimeter (continuity)
B. Logic probe
C. Test light
D. Scan tool

13. When testing for a short to voltage in a circuit, which of these procedures is CORRECT?

A. Disconnect the circuit from ground and check resistance between the wire and power
B. Leave the circuit connected and measure current flow with an ammeter
C. Apply power to the circuit and check for excessive resistance
D. Disconnect the circuit from its power source and check for voltage between the wire and ground

14. A truck has multiple electronic systems that are not functioning properly. Technician A says to check the main power distribution center fuses. Technician B says to verify the integrity of the data bus network. Who is right?

A. B only
B. Neither A nor B
C. Both A and B
D. A only

15. When using a scan tool to diagnose a truck's electronic systems, what does it mean when the tool reports 'No Communication' with a specific module?

A. The scan tool software needs to be updated
B. The scan tool cannot establish data communication with the module
C. The module is functioning but has no stored fault codes
D. The truck's ignition must be turned to the ON position

16. On a 24-volt electrical system, what is the expected voltage reading across two 12-volt batteries connected in series?

A. Approximately 24 volts
B. Approximately 12 volts
C. Approximately 36 volts
D. Approximately 48 volts

17. What safety precaution should ALWAYS be taken before working on a truck's electrical system?

A. Turn on all lights to drain the system
B. Connect a scan tool to the data port
C. Set the parking brake
D. Disconnect the negative battery cable

18. A technician is diagnosing an intermittent electrical problem. The issue only occurs when the truck is driving over rough roads. What is the MOST likely cause?

A. Incorrect programming
B. Overheated components
C. Loose or damaged connections
D. Faulty control module

19. When analyzing a waveform from a truck's electronic sensor using an oscilloscope, what does a flat line at zero volts typically indicate?

A. Battery voltage is present at the sensor
B. Short to ground in the sensor circuit
C. Open circuit in the sensor wiring
D. Normal sensor operation

20. What is the correct way to diagnose a suspected high resistance connection in a truck's electrical circuit?

A. Perform a voltage drop test while the circuit is operating under load
B. Check resistance with the circuit power off
C. Measure current flow across the connection
D. Test the circuit with a test light

21. A technician is measuring the voltage across a battery with the engine off. The reading is 12.4 volts. What is the approximate state of charge of this battery?

A. 50%
B. 90%
C. 100%
D. 75%

22. When conducting a battery load test, for how long should the load be applied?

A. 30 seconds
B. 1 minute
C. 15 seconds
D. 5 seconds

23. A truck's batteries are being tested for capacity. If each battery is rated at 850 CCA (Cold Cranking Amps) and they are connected in parallel, what would be the total CCA capacity?

A. 3,400 CCA
B. 1,700 CCA
C. 850 CCA
D. 425 CCA

24. When performing a voltage drop test on a battery cable, the maximum acceptable voltage drop is:

A. 0.2 volts
B. 0.5 volts
C. 1.0 volts
D. 2.0 volts

25. A truck's starter draws excessive current but cranks slowly. Technician A says this could be caused by a defective starter motor. Technician B says this could be caused by engine mechanical problems. Who is right?

A. A only
B. B only
C. Neither A nor B
D. Both A and B

26. When jump-starting a truck with discharged batteries, the correct connection sequence is:

A. Positive to positive, then negative to positive
B. Positive of good battery to negative of dead battery, then negative of good battery to positive of dead battery
C. Positive of good battery to positive of dead battery, then negative of good battery to negative of dead battery or engine ground
D. Negative of good battery to negative of dead battery, then positive of good battery to positive of dead battery

27. A truck has multiple batteries that read 12.6 volts individually, but the voltage at the starter is only 10.5 volts during cranking. The most likely cause is:

A. Low electrolyte levels
B. High resistance in the battery cables or connections
C. Defective batteries
D. Shorted starter solenoid

28. When testing a battery with a digital multimeter, which setting should be used first?

A. DC voltage
B. AC voltage
C. Ohms
D. Amps

29. A truck's batteries are in good condition, but the starter makes a single loud click and will not crank the engine. The most likely cause is:

A. A weak battery
B. A faulty ignition switch
C. A seized engine
D. An open circuit in the starter motor

30. What is the most accurate method to test for a parasitic battery drain?

A. Check the specific gravity of each battery cell
B. Connect a test light between the positive terminal and ground
C. Connect a digital multimeter in series with the negative battery cable
D. Measure voltage drop across the battery overnight

Answer Key & Explanations

1. D — Digital multimeter (ohms)
A digital multimeter set to measure ohms is the most effective tool for finding a short to ground. By disconnecting components and measuring resistance to ground, a technician can isolate which component or section of wiring is causing the short.

2. C — Both A and B
Both technicians are correct. A loose battery connection can cause voltage fluctuations in the electrical system, resulting in flickering lights. Similarly, a faulty alternator that produces inconsistent output voltage would cause the same symptom.

3. B — Place meter leads on both sides of the switch with the circuit energized
To properly measure voltage drop across a switch, the circuit must be energized (on) with current flowing through it, and the multimeter leads must be placed on both sides of the switch simultaneously.

4. A — Pull fuses one at a time while monitoring amperage
A parasitic draw of 2.5 amps is excessive and will quickly drain the battery. The best next step is to pull fuses one at a time while monitoring the amperage to isolate which circuit is causing the excessive draw.

5. D — There is an open somewhere in the circuit
An OL (infinite resistance) reading indicates there is no complete path for current to flow, confirming an open circuit exists somewhere between the two test points.

6. C — Check coil resistance and test continuity of contacts
To properly test a relay with a DMM, you should check coil resistance by measuring across the control terminals, and then verify continuity of the switch contacts both in their normal state and when the coil is energized.

7. B — Test the door switch for proper operation
The first step should be to verify that the door switch is functioning correctly by checking if it shows continuity when the door is open. This is the logical starting point as it's one of the input sensors for the warning chime circuit.

8. A — A brown wire with white stripe, circuit number 141
On wiring diagrams, the color code typically indicates the wire's color (in this case brown with a white stripe) and the circuit or wire number (141), which helps identify specific wires in the harness.

9. D — Open circuit in the data bus wiring
When some modules communicate but others don't in a multiplexed network, the most likely cause is an open circuit in the data bus wiring that is preventing communication with specific modules while allowing others to function.

10. C — Circuit current draw with an ammeter
The first measurement should be circuit current draw with an ammeter. This will show if the circuit is drawing excessive current (above 10 amps) which would explain why the fuse keeps blowing, and help determine if there's a short or overload condition.

11. B — Greater than 0.1 volts
A good ground connection should have minimal resistance and therefore minimal voltage drop. A reading greater than 0.1 volts indicates excessive resistance in the ground connection, which can affect circuit operation.

12. A — Digital multimeter (continuity)
A digital multimeter set to measure continuity (resistance) is the best tool for checking if there is an open in the wiring between the sensor and ECM, as it can directly verify if the electrical path is complete.

13. D — Disconnect the circuit from its power source and check for voltage between the wire and ground
To test for a short to voltage, the circuit should be disconnected from its power source, and then a voltmeter should be connected between the suspected wire and ground. If voltage is present when it should not be, this indicates a short to voltage from another source.

14. C — Both A and B
Both technicians are correct. Main power distribution fuses could be blown, preventing power from reaching multiple systems. Similarly, a fault in the data bus network could prevent proper communication between modules, causing multiple systems to malfunction.

15. B — The scan tool cannot establish data communication with the module
A 'No Communication' message means the scan tool cannot establish data communication with that specific module. This could be due to the module being defective, a power or ground issue to the module, or a problem with the data bus wiring connecting to that module.

16. A — Approximately 24 volts
In a properly functioning 24-volt system with two 12-volt batteries connected in series, the total voltage should be the sum of the individual battery voltages, which is approximately 24 volts (typically 24.5-25.5 volts with the engine running).

17. D — Disconnect the negative battery cable
Disconnecting the negative battery cable is the primary safety precaution before working on electrical systems. This prevents accidental shorts, electrical shocks, and potential damage to electronic components.

18. C — Loose or damaged connections
Intermittent electrical issues that occur specifically when driving over rough roads are most likely caused by loose or damaged connections. The vibration from rough roads can temporarily break contact in wiring connections that are not secure.

19. B — Short to ground in the sensor circuit
A flat line at zero volts typically indicates a short to ground in the sensor circuit. This prevents the normal signal voltage from appearing and results in a constant zero volt reading.

20. A — Perform a voltage drop test while the circuit is operating under load
The correct way to diagnose a high resistance connection is to perform a voltage drop test while the circuit is operating under load. This will reveal excessive voltage drop across the connection, indicating high resistance.

21. D — 75%
A 12.4 volt reading indicates a battery that is approximately 75% charged. A fully charged battery typically reads 12.6-12.8 volts at rest.

22. C — 15 seconds
The standard procedure for a battery load test is to apply the load for 15 seconds while monitoring voltage. This is sufficient time to evaluate the battery's performance without causing damage.

23. B — 1,700 CCA
When batteries are connected in parallel, the amperage (CCA) adds together, while the voltage remains the same. Two 850 CCA batteries in parallel would provide 1,700 CCA.

24. A — 0.2 volts
The industry standard for maximum acceptable voltage drop in a battery cable is 0.2 volts. Anything higher indicates excessive resistance in the circuit that requires attention.

25. D — Both A and B
Both are correct. A defective starter motor with worn bushings or damaged armature can draw high current while cranking slowly. Mechanical engine problems like high compression or seized components can also cause slow cranking with high current draw.

26. C — Positive of good battery to positive of dead battery, then negative of good battery to negative of dead battery or engine ground
The proper jump-starting procedure is to connect positive to positive first, then the negative of the good battery to the negative of the dead battery or engine block/frame ground. This reduces the risk of sparks near the battery which could ignite hydrogen gas.

27. B — High resistance in the battery cables or connections
High resistance in the battery cables or connections will cause excessive voltage drop during high current draw situations like cranking, resulting in low voltage at the starter despite good battery voltage readings.

28. A — DC voltage
DC voltage is the first measurement to take when testing a battery, as it provides the battery's state of charge before conducting any load or other tests.

29. D — An open circuit in the starter motor
A single loud click typically indicates the solenoid is engaging but the starter motor is not turning. This is most commonly caused by an open circuit in the starter motor or poor connections within the starter assembly.

30. C — Connect a digital multimeter in series with the negative battery cable
Using a digital multimeter set to measure amps in series with the battery's negative cable is the most accurate method to measure parasitic drain. This allows precise measurement of the current draw with the vehicle off.

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