PRACTICE EXAM 4: ASE A6 SIMULATION (50 QUESTIONS)

1. A circuit has 4 amperes flowing through a 3-ohm resistor. What is the voltage drop across the resistor?

A. 0.75 volts

B. 12 volts

C. 7 volts

D. 1.33 volts

2. A technician is using a DMM to measure voltage across a running circuit. The meter reads correctly but slowly updates each reading. This behavior is caused by:

A. The meter's internal averaging rate, which is normal operation

B. A discharged internal battery in the DMM

C. A damaged test lead causing high resistance

D. Incorrect range selection on the meter's rotary dial

3. Kirchhoff's voltage law states that the sum of all voltages around a closed loop equals:

A. The voltage source plus all dropped voltages

B. Twice the source voltage under load conditions

C. Half the source voltage due to parallel branching

D. Zero, because all voltage drops equal the source voltage

4. A technician is measuring current through a starter circuit but finds the DMM reads "OL" (overload). The correct action is to:

A. Replace the DMM because it has an internal fault

B. Move the positive lead to the voltage jack instead of current

C. Switch to a current clamp capable of higher current ranges

D. Reduce engine load by disconnecting the fuel pump temporarily

5. A 4-ohm resistor and a 6-ohm resistor are connected in series. The total resistance is:

A. 2.4 ohms

B. 10 ohms

C. 24 ohms

D. 5 ohms

6. A technician observes that a diode shows 0.5 ohms in both directions during ohmmeter testing. This indicates:

A. A properly functioning silicon diode

B. A healthy germanium diode with low forward drop

C. An open circuit requiring no further testing

D. A shorted diode requiring replacement

7. The ground symbol on a wiring diagram that shows a downward-pointing triangle typically represents:

A. A connection to the vehicle's ground reference system

B. The negative terminal of the battery only

C. An ignition-switched input from the control panel

D. A network communication termination point

8. Technician A says that a MOSFET gate draws virtually no current when switching loads. Technician B says that a BJT base draws no current to control collector current. Who is correct?

A. Both A and B

B. Technician B only

C. Technician A only

D. Neither A nor B

9. A technician needs to repair a damaged section of 14-gauge wire. The correct replacement wire should be:

A. 18-gauge wire for easier handling and installation

B. 14-gauge wire matching the original specification

C. 20-gauge wire since the circuit current is low

D. Any gauge as long as the insulation color matches

10. Automotive wire is typically stranded rather than solid because:

A. Stranded wire is cheaper to manufacture than solid wire

B. Solid wire cannot be soldered at automotive temperatures

C. Stranded wire has lower resistance per unit length

D. Stranded wire tolerates continuous vibration without fatigue

11. A lab scope is being used to diagnose a CAN bus. The scope shows CAN-H and CAN-L waveforms that are not mirror images of each other. This indicates:

A. Normal operation of a healthy bus under light load

B. Standard behavior during scan tool communication

C. A fault in the differential signaling or one wire is damaged

D. The scope is improperly triggered and should be reset

12. A technician is troubleshooting a circuit with a voltmeter and finds 12 volts at the switch input but zero volts at the switch output with the switch closed. The fault is:

A. In the wiring between the switch output and the load

B. Within the switch itself, preventing contact completion

C. In the switch input wiring to the power source

D. At the ground connection of the load being tested

13. The formula for calculating power when voltage and current are known is:

A. $P = E \times I$ (power equals voltage times current)

B. $P = E \div I$ (power equals voltage divided by current)

C. $P = I \times R^2$ (power equals current times resistance squared)

D. $P = E^2 \times R$ (power equals voltage squared times resistance)

14. A battery shows 11.5 volts at rest after sitting overnight. The state of charge is approximately:

A. Fully charged at 100 percent

B. 75 percent charged and usable

C. 50 percent charged but serviceable

D. Essentially discharged, below 25 percent

15. Sulfation of battery plates typically occurs from:

A. Overcharging a battery at excessive voltages

B. Rapid charging from a discharged state

C. Long-term partial discharge or sitting discharged

D. Excessive cranking events in cold weather

16. The terms "CCA" and "RC" on a battery label stand for:

A. Constant Current Amperes and Recovery Capacity

B. Cold Cranking Amperes and Reserve Capacity

C. Charging Current Amount and Rated Capacitance

D. Cell Capacity Analysis and Regulated Conductance

17. Technician A says a battery load test requires a fully charged battery to produce valid results. Technician B says a conductance tester can provide meaningful results on a partially discharged battery. Who is correct?

A. Technician A only

B. Neither A nor B

C. Technician B only

D. Both A and B

18. A battery hydrometer reads 1.165 specific gravity on one cell while the other five cells read 1.265. The battery:

A. Has a damaged or shorted cell and must be replaced

B. Is fully charged and ready for service

C. Needs only a simple topping off with distilled water

D. Is overfilled with electrolyte and must be drained

19. When connecting jumper cables between two vehicles, the cable should be connected to the discharged vehicle's:

A. Negative battery post directly for best conductivity

B. Positive post first, then back to the good vehicle

C. Positive post first on the dead, then positive on the good, negative on the good, and ground point on the dead

D. Both posts simultaneously to avoid any electrical transient

20. Modern vehicles with start-stop systems typically use what type of battery?

A. AGM (Absorbed Glass Mat) or EFB (Enhanced Flooded)

B. Deep-cycle marine-rated flooded battery

C. Standard flooded lead-acid battery

D. Lithium iron phosphate battery

21. A starter motor that turns slowly but does crank the engine typically indicates:

A. A failed solenoid that needs immediate replacement

B. A broken starter drive ring gear contact

C. A normal condition for all cold-engine starts

D. Low battery voltage or high-resistance cabling

22. A starter makes a grinding noise when activated. The MOST likely cause is:

A. Damage to the flywheel ring gear teeth

B. A failed ignition switch contact

C. Insufficient engine oil pressure during cranking

D. A discharged battery reducing motor speed

23. The voltage regulator controls alternator output by:

A. Adjusting the strength of the permanent magnets in the rotor

B. Varying the current through the rotor field winding

C. Switching between three-phase and single-phase operation

D. Changing the drive belt ratio at the crankshaft pulley

24. A technician performs a voltage drop test between the alternator B+ terminal and the battery positive post. The reading is 1.1 volts during charging. This indicates:

A. A healthy charging cable operating normally

B. A failed voltage regulator in the alternator

C. Excessive resistance in the charging cable or connections

D. An overcharging condition requiring regulator replacement

25. A computer-controlled charging system commands reduced voltage during deceleration to:

A. Recover vehicle kinetic energy through increased alternator load

B. Protect the battery from overcharging during high-speed driving

C. Reduce fuel consumption under highway cruise conditions

D. Extend the service life of the transmission control module

26. The three-phase AC output of an alternator is converted to DC by:

A. A single large power transistor in the output circuit

B. Capacitors mounted externally to the alternator housing

C. The vehicle battery's internal chemistry during charging

D. Six diodes arranged as a full-wave rectifier bridge

27. Technician A says drive belt slippage can cause undercharging that appears to be an alternator fault. Technician B says a loose or glazed drive belt should be inspected before diagnosing charging complaints. Who is correct?

A. Technician A only

B. Both A and B

C. Neither A nor B

D. Technician B only

28. A halogen headlight bulb with 55-watt rating draws approximately how much current at 12 volts?

A. 12 amperes

B. 0.22 amperes

C. 6.6 amperes

D. 4.6 amperes

29. HID bulbs typically take how long to reach full brightness?

A. 10 to 30 seconds after activation

B. Less than 100 milliseconds immediately on

C. 2 to 5 minutes for complete warm-up

D. 15 minutes of continuous operation required

30. A turn signal switch is stuck in the hazard position and will not reset. The driver should be advised that:

A. The turn signal flasher is the most likely component at fault

B. The battery should be disconnected temporarily to reset the flasher

C. The hazard switch or its mechanism requires inspection and service

D. The vehicle cannot be legally operated with this condition

31. Daytime running lights that illuminate dimmer than normal high beams may be operating:

A. At reduced voltage, commonly around 60 percent of normal

B. At full voltage through a current-limiting resistor

C. Only during specific ambient light conditions automatically

D. Alternately to extend the life of the headlight filament

32. A rain-sensing wiper system detects precipitation using:

A. Piezoelectric sensors measuring raindrop impact force

B. Ultrasonic sensors detecting surface moisture content

C. Optical sensors measuring infrared reflection changes from water on glass

D. Humidity sensors within the cabin HVAC system ducting

33. A customer's tail lights work normally but the brake lights do not illuminate when the pedal is pressed. The MOST likely cause is:

A. A burned-out tail light bulb affecting the brake circuit

B. A failed center high-mount stop lamp bulb assembly

C. A shared ground problem on all three brake circuits

D. A faulty brake light switch at the pedal assembly

34. A modern instrument cluster displays engine coolant temperature based on:

A. A dedicated temperature sensor wired directly to the cluster

B. A digital message from the engine control module over the vehicle network

C. The mechanical position of a bimetallic strip in the gauge

D. A direct analog signal from the radiator coolant outlet

35. A gauge on an instrument cluster reads incorrectly while the scan tool shows correct values for the same parameter. The fault is MOST likely in:

A. The sensor providing the data to the broadcasting module

B. The BCM input processing the sensor signal

C. The instrument cluster itself or its data reception

D. The vehicle's ignition switch and related wiring

36. During the key-on bulb check, all warning lamps on the instrument cluster illuminate briefly. If one lamp does not illuminate during this test, the fault is:

A. In that specific lamp's circuit or driver stage

B. In the system the lamp normally monitors

C. Indicative of a completely normal cluster condition

D. Caused by the battery voltage being too low

37. Federal law requires the odometer reading on a replacement instrument cluster to be:

A. Set to zero after installation to reflect the new cluster's installation date

B. Multiplied by a regional market factor based on the vehicle's age

C. Programmed to match the value displayed at the next service interval

D. Programmed to match the original cluster's reading exactly

38. A head-up display shows a brief "ghost" image above the primary display. This indicates:

A. A failing HUD projector requiring replacement

B. A non-HUD-compatible windshield installed on the vehicle

C. Dust or contamination on the projector lens assembly

D. Software corruption requiring cluster module reprogramming

39. When diagnosing an incorrectly illuminated check-engine warning lamp, the technician should FIRST:

A. Replace the instrument cluster as the most likely fault

B. Disconnect the battery to reset the stored fault codes

C. Scan the engine control module for stored DTCs

D. Test the cluster's warning lamp driver circuit

40. A power window switch operates the window from the driver's master switch but not from the passenger door switch. The MOST likely cause is:

A. A failed passenger door switch or break in its signal wiring

B. A defective window motor with reduced torque output

C. A blown fuse common to both switches in the fuse panel

D. A disconnected battery cable affecting door module supply

41. Modern power window auto-up pinch protection detects obstructions by:

A. Using an infrared beam across the window opening path

B. Measuring glass surface pressure via piezoelectric sensors

C. Timing each up-travel cycle against a stored maximum duration

D. Monitoring motor current for the spike caused by obstruction

42. A driver's door lock operates from the key fob but not from the interior door lock switch. The MOST likely cause is:

A. A failed lock actuator with stuck internal contacts

B. A blown lock circuit fuse in the main fuse panel

C. A faulty interior lock switch or broken switch wiring

D. An unsynchronized rolling code between the fob and module

43. A rear defogger grid has one horizontal trace that does not heat while others operate. The fault is in:

A. The defogger relay or fuse supplying the entire grid

B. The specific trace on the glass, which is broken

C. The dashboard defogger switch or its indicator lamp

D. The body control module timing circuit for the defogger

44. Before performing any service on a supplemental restraint system component, the technician MUST:

A. Disconnect the battery and wait the manufacturer-specified time

B. Scan the SRS module for DTCs with the ignition on

C. Wear rubber gloves rated for high-voltage work

D. Drive the vehicle briefly to settle the SRS module

45. Which of the following is NOT typically a function of the body control module (BCM)?

A. Processing inputs from door lock switches and windows

B. Commanding exterior lighting based on switch inputs and conditions

C. Controlling interior illumination timing and dimming operation

D. Directly generating high-voltage ignition spark for the engine

46. A healthy high-speed CAN bus measured across CAN-H and CAN-L with ignition off reads approximately:

A. 30 ohms, showing bus integrity with shortened pairs

B. 120 ohms, matching a single active terminator

C. 60 ohms, indicating two parallel 120-ohm terminators

D. Zero ohms, because network protocols must allow current flow

47. The LIN bus protocol differs from CAN bus primarily because LIN:

A. Uses differential signaling at higher speeds than CAN

B. Uses a single wire plus ground at much slower speeds

C. Operates through fiber-optic cables immune to interference

D. Requires a dedicated master module for each slave on the bus

48. A DTC of U0121 typically indicates:

A. Lost communication with the anti-lock brake module

B. A fault in the engine's oxygen sensor heater circuit

C. A high-voltage condition detected on the HS-CAN bus

D. A calibration fault in the instrument cluster module

49. A modern vehicle's infotainment head unit serves as the central interface for:

A. Only the radio audio and basic Bluetooth phone integration

B. The vehicle's SRS airbag deployment decision logic

C. Engine control module software programming and updates

D. Climate control, vehicle settings, camera displays, and media

50. When replacing an SRS component, the squib connector includes a shorting bar that:

A. Provides low-resistance continuity for SRS module testing

B. Automatically shorts the squib wires when disconnected, preventing accidental deployment

C. Allows the module to measure squib resistance during normal operation

D. Reduces electromagnetic interference from the squib harness

Practice Exam 4: Answer Key and Explanations

1. B — Applying Ohm's Law, E = I × R, so 4 amperes × 3 ohms = 12 volts. This calculation determines voltage drop across any component when current and resistance are known. Fluency with the three forms of Ohm's Law is essential for virtually every electrical diagnostic scenario on the A6 exam.

2. A — DMMs include internal signal averaging that smooths rapidly changing measurements into stable displayed values. Typical update rates are 2–4 readings per second, which produces the characteristic slow display refresh on voltage readings. This is normal operation designed to prevent constantly flickering numbers, not a meter fault.

3. D — Kirchhoff's voltage law states that the sum of all voltage drops around a closed circuit equals zero — the source voltage is divided among the components, and everything balances at the loop's completion. This principle underlies series circuit analysis and explains why voltage drops across components must sum to the source voltage.

4. C — An "OL" reading during current measurement indicates current exceeds the meter's range, typically 10–20 amperes for handheld DMMs. Starter circuits draw 150–300 amperes, far beyond direct in-line DMM capability. Inductive current clamps measure high currents without breaking the circuit and are the correct tool for starter and charging system current measurements.

5. B — Series resistances add directly, so 4 ohms + 6 ohms = 10 ohms. This is Kirchhoff's current law applied to series circuits — current takes one path through each component in sequence. Recognizing how resistors combine in series versus parallel is foundational to circuit analysis on the A6 exam.

6. D — A healthy diode shows high resistance in one direction (reverse bias, OL) and low resistance in the other (forward bias, ~0.6–0.7 V drop). Low resistance in both directions means the PN junction has failed and shorted through. A diode reading low in both directions must be replaced; the circuit will not function correctly with a shorted diode.

7. A — The downward-pointing triangle is the standard electrical symbol for ground — the common reference point to which all circuit voltages are measured. In a vehicle, this typically represents the chassis, engine block, and battery negative terminal as a shared reference. Recognizing ground symbols in schematics is essential for circuit interpretation.

8. C — MOSFETs use a voltage-controlled gate that is insulated from the channel, so virtually no current flows through the gate during switching. BJTs require a small base current to control much larger collector current — the base is a current-controlled terminal, not voltage-controlled. Technician B is incorrect; BJTs do require base current for operation.

9. B — Matching original wire gauge preserves the circuit's current-carrying capacity and voltage drop characteristics. Using a smaller gauge introduces higher resistance, voltage drop problems, and inadequate fault-current protection. Larger gauge is acceptable; smaller gauge is not. The original gauge specification reflects engineering decisions about current capacity and fault protection.

10. D — Stranded wire distributes flex stress across many fine conductors rather than concentrating it on a single wire. Solid wire fatigues and eventually breaks at vibration points, making it unsuitable for automotive use. Every wire in a vehicle's harness is stranded copper to tolerate decades of continuous vibration without fatigue failure.

11. C — Healthy CAN-H and CAN-L waveforms are mirror images of each other around a 2.5-volt reference — the differential signaling that provides noise immunity. Asymmetric waveforms indicate single-wire faults, damaged transceivers, or termination problems. This is a key diagnostic signature for CAN network issues that a scope reveals clearly.

12. B — Twelve volts at the switch input but zero at the switch output with the switch closed means the switch is not completing the circuit. The switch itself is the fault — contacts that fail to close, worn contacts with high resistance, or a broken internal mechanism. Switch replacement is the repair after verification the wiring is intact.

13. A — Watt's Law states that power equals voltage times current: $P = E \times I$. This is the fundamental relationship for calculating electrical power consumption in any circuit. Combined with Ohm's Law, it provides all the formulas needed for automotive electrical calculations. Memorize both equations for essential exam readiness.

14. D — A battery reading 11.5 volts at rest is essentially discharged, below 25 percent state of charge. The voltage-to-SOC relationship for lead-acid batteries shows 12.6 volts as 100%, 12.4 volts as 75%, 12.2 volts as 50%, 12.0 volts as 25%, and below 11.9 volts as essentially discharged. Recharging to full and testing health is the next step.

15. C — Sulfation develops when a battery sits in a partially discharged state. Lead sulfate crystals harden on the plates over time and eventually stop participating in the charge-discharge reaction. Severe sulfation is permanent and causes reduced capacity, poor cranking performance, and eventual battery failure. Keeping batteries fully charged prevents sulfation.

16. B — CCA (Cold Cranking Amperes) and RC (Reserve Capacity) are the two primary performance specifications on battery labels. CCA measures cold-start capability at 0°F; RC measures capacity support for vehicle loads if charging fails. Both ratings matter for specific applications and must match OEM specifications on replacements.

17. D — Carbon-pile load testers require a fully charged battery because they evaluate stored capacity through voltage response. Conductance testers measure internal battery condition electrically and produce valid results even on partially discharged batteries. Both technicians correctly describe their respective test requirements, making both statements true.

18. A — A single cell reading significantly lower than others indicates a damaged or shorted cell that cannot be recovered. Normal batteries have cell-to-cell variation under 0.025 specific gravity; variations over 0.050 between cells indicate cell damage. Replacement is required; topping off, charging, or other service cannot fix a damaged cell.

19. C — The correct jumper cable sequence is: positive to discharged battery first, positive to good battery second, negative to good battery third, ground point on discharged vehicle's engine last. The final ground connection at the engine block keeps any spark away from accumulated hydrogen gas around the dead battery. This sequence prevents ignition.

20. A — Start-stop systems repeatedly deep-cycle the battery during engine-off periods, requiring batteries designed for this duty. AGM batteries handle deep cycling with excellent durability; EFB provides similar capability at lower cost. Conventional flooded batteries fail prematurely in start-stop service and should not be used as replacements on start-stop vehicles.

21. D — Slow cranking with the engine turning indicates insufficient current delivery to the starter. The battery may be weak but not completely dead, or resistance in the cables or connections is dropping voltage. Voltage drop testing during cranking identifies the specific cause — weak battery, cable resistance, or high-resistance ground path.

22. A — Grinding noise during cranking typically indicates physical contact between the starter pinion and damaged flywheel ring gear teeth. Missing or chipped teeth cause the pinion to mesh improperly and grind during engagement. Flywheel ring gear inspection and repair/replacement is required before installing a replacement starter, which would also be damaged.

23. B — The voltage regulator controls alternator output by varying the current through the rotor field winding. More field current creates a stronger magnetic field, inducing higher voltage in the stator. Less field current produces lower output voltage. This electrical field control is what allows voltage regulation independent of RPM and load.

24. C — A voltage drop of 1.1 volts across the charging cable is excessive — acceptable values are typically under 0.3 volts for this circuit. High voltage drop indicates corrosion, damaged wire, or loose connections. The alternator itself is producing correct output; the wiring is the fault, and replacement is unnecessary until the cable issue is resolved.

25. A — Computer-controlled charging systems deliberately increase charging voltage during deceleration to recover vehicle kinetic energy. This converts kinetic energy into electrical energy that charges the battery, similar in principle to regenerative braking. The engine control module commands elevated alternator output during braking events to capture this otherwise-wasted energy.

26. D — A rectifier bridge uses six diodes arranged in pairs to convert three-phase AC from the stator into DC output. Three positive diodes and three negative diodes form the bridge, with two diodes conducting at any instant corresponding to whichever two phases currently have the greatest voltage difference. This rectification produces the smooth DC output for vehicle loads.

27. B — Drive belt problems — looseness, glazing, or slippage — reduce the torque transferred from engine to alternator. Belt issues produce charging symptoms that appear electrical but are mechanical. Technician A correctly identifies this common oversight; Technician B correctly advises belt inspection as an essential early diagnostic step before any electrical testing.

28. D — Current equals power divided by voltage: 55 W ÷ 12 V = 4.58 amperes, rounded to 4.6 amperes. This calculation applies Ohm's Law inversely to determine current draw from bulb wattage and voltage. Understanding this relationship is essential for sizing fuses, evaluating wire gauges, and predicting circuit loads.

29. A — HID bulbs require 10–30 seconds to reach full brightness because the metal halide salts inside must vaporize and the arc must fully establish before the bulb operates at rated output. This is a normal characteristic of HID technology, not a fault. LED headlights reach full brightness instantly; halogen takes only milliseconds.

30. C — A hazard switch mechanism that is stuck in position prevents the turn signal switch from returning to normal operation. Inspection of the hazard switch assembly and its mechanism is required to restore normal switch function. The switch may need replacement or service to correct the jamming. The vehicle can legally operate, but the condition must be addressed.

31. A — Daytime running lights on many vehicles operate the high-beam headlight filaments at reduced voltage, typically around 60% of normal (7-9 volts instead of 14). This produces dimmer but continuous output for daytime visibility. Other implementations use dedicated DRL lamps or operate fog lights at reduced intensity.

32. C — Rain-sensing wipers use optical sensors that measure infrared light reflection from the windshield. Water droplets reduce total internal reflection; the sensor detects this change and commands wiper activation. This is the dominant rain-sensing technology on modern vehicles, and the sensor requires a clean windshield and proper optical coupling for accurate operation.

33. D — A fault specifically affecting brake lights (while tail lights work) isolates the problem to the brake-only portion of the circuit. The brake light switch at the pedal is typically the failure point — contacts that won't close when the pedal is pressed, or a misadjusted switch position. This is a common service item affecting both safety and traffic violation exposure.

34. B — Modern instrument clusters receive virtually all data through vehicle serial networks. The engine control module reads the coolant temperature sensor, processes the signal, and broadcasts the value on CAN. The cluster receives the network message and drives its display accordingly. Direct sensor-to-cluster wiring is largely obsolete on modern vehicles.

35. C — If the scan tool shows correct values but the cluster displays incorrectly, the data is reaching the cluster (because the scan tool can see the same network message). The cluster's reception or rendering must be the issue. This indicates an internal cluster fault, corrupted cluster firmware, or a specific display problem in the cluster module.

36. A — A warning lamp that fails to illuminate during bulb check indicates the lamp itself or its driver circuit has failed. The self-test verifies each lamp is functional; a non-lighting lamp confirms a lamp-circuit fault. This is distinct from a lamp that stays illuminated after self-test, which indicates a fault in the monitored system.

37. D — Federal law prohibits odometer tampering. A replacement cluster must be programmed to match the original cluster's mileage exactly. Setting to zero, adjusting by market factor, or any other modification creates legal exposure and is prohibited. Proper programming is mandatory on every cluster replacement.

38. B — HUD-equipped vehicles require a specific windshield with a wedge-shaped PVB inner layer that prevents ghost imaging. A standard replacement windshield reflects the image from both surfaces of the glass, creating the characteristic ghosted double image. This is the single most common cause of HUD ghosting after glass service, and requires correct windshield installation to resolve.

39. C — Modern warning lamps are commanded by the module responsible for the monitored system. A check-engine warning lamp is commanded by the engine control module. Scanning the ECM for stored DTCs identifies the root cause. Replacing the cluster or attempting to reset the system without understanding the underlying fault is ineffective.

40. A — A window that operates from one switch but not another isolates the fault to the non-working switch's circuit. The motor, regulator, and master switch path function normally since the window moves from the master. A defective passenger door switch or broken wiring between switch and door control module is the most likely cause.

41. D — Pinch protection on modern power windows monitors motor current through the H-bridge driver during up-travel. An obstruction causes a sudden current spike that the module detects, immediately reversing motor direction to prevent injury. This function is federally mandated on auto-up windows and protects occupants from pinching hazards.

42. C — The lock actuator responds to fob commands, confirming the module, actuator, and wiring are functional for that command path. A separate switch circuit provides the interior switch input. A defective switch or broken switch-to-module wiring is the most likely cause when fob operation works but interior switch doesn't.

43. B — A defogger grid has multiple parallel traces; one broken trace disables only that one line while others continue operating. A voltmeter walking along the broken trace locates the break where voltage drops abruptly. Small breaks can be repaired with silver-ceramic paint kits; larger damage requires glass replacement.

44. A — Every SRS requires a manufacturer-specified disabling procedure including battery disconnection and a wait period (typically 1–10 minutes) for deployment-energy capacitors to discharge. Accidental deployment during service can cause severe injury. This procedural requirement is not optional and must be followed on every SRS service task.

45. D — The BCM manages body functions: door locks, windows, interior lights, exterior lighting, and HVAC. The engine control module (ECM) — not the BCM — generates ignition spark timing. Ignition is a powertrain function, not a body function. Understanding the division of responsibility between modules is essential for modern vehicle diagnosis.

46. C — A healthy high-speed CAN bus uses two 120-ohm termination resistors at its physical endpoints. Measured across CAN-H and CAN-L with the ignition off, these two resistors appear in parallel, giving a combined reading of approximately 60 ohms. This is a key diagnostic check — significant deviation indicates missing, added, or shorted terminators.

47. B — LIN is a single-wire network (plus ground) operating at 1–20 kbit/s using master-slave communication. This slower, simpler architecture suits low-bandwidth applications like window switches and mirror motors. CAN uses differential signaling at much higher speeds for critical applications. Both protocols coexist on modern vehicles, each optimized for specific applications.

48. A — The U0121 code specifically indicates lost communication with the anti-lock brake module. U-codes (network family) identify communication faults; each specific number points to a particular module. Multiple U-codes across many modules often indicate bus-level faults, while a single U-code suggests that specific module is offline or has lost its bus connection.

49. D — Modern infotainment head units integrate climate control, vehicle settings menus, camera displays (backup, surround-view), media playback, navigation, and phone/device integration. They have become the central user interface for most non-driving vehicle functions. Infotainment failures can affect many apparently unrelated systems due to this deep integration.

50. B — Squib connectors include a mechanical shorting bar that automatically shorts the two squib wires together when the connector is disconnected. This prevents stray voltages from static electricity, inadvertent battery contact, or test equipment from triggering accidental deployment. When the connector reconnects, the shorting bar retracts for normal operation. This is a critical safety feature during service.