

PRACTICE EXAM 10: ASE A6 SIMULATION

(50 QUESTIONS)

1. A 60-watt load operates at 12 volts. The current draw of this load is:
 - A. 0.2 amperes during operation
 - B. 720 amperes at peak output
 - C. 12 amperes at steady state
 - D. 5 amperes through the circuit

2. A technician is comparing voltage at two points in a circuit. The positive probe reads 12.0 volts at the battery and 10.3 volts at the load. This 1.7-volt difference represents:
 - A. Normal operation for a typical circuit
 - B. Voltage drop across the wiring and connections
 - C. A short circuit between the battery and load
 - D. An overcharging condition in the alternator

3. Kirchhoff's current law states that the current flowing into a node must:
 - A. Equal the current flowing out of that node
 - B. Be greater than the current flowing out
 - C. Equal zero when the circuit is at rest
 - D. Double across parallel branches automatically

4. A technician uses a DMM to test continuity on a wire. The meter beeps and shows 0.5 ohms. This indicates:

- A. An open circuit requiring repair immediately
- B. Excessive resistance in a short circuit condition
- C. Good continuity through a healthy wire
- D. A short-to-ground fault in the circuit

5. The power dissipated by a 3-ohm resistor carrying 4 amperes is:

- A. 7 watts during operation
- B. 48 watts at steady state
- C. 1.33 watts of continuous output
- D. 12 watts across the element

6. A short to ground in an electrical circuit:

- A. Increases the circuit voltage to exceed battery levels
- B. Prevents current from flowing in any direction
- C. Causes intermittent operation at random intervals
- D. Creates a low-resistance path to ground, blowing the fuse

7. Technician A says that an incandescent test light can damage module input circuits due to its high current draw. Technician B says logic probes are inappropriate for testing automotive circuits and should not be used. Who is correct?

- A. Technician A only; test lights can damage modules
- B. Technician B only; logic probes are not suitable
- C. Both A and B, both observations are valid
- D. Neither, both tools are interchangeable

8. A wire color code of "WH/RD" indicates the wire has:

- A. A red base color with a white primary stripe
- B. A solid white wire with no tracer markings
- C. A white base color with a red tracer stripe
- D. Two separate wires, white and red, bundled together

9. Resistance in a wire is directly proportional to:

- A. The wire's cross-sectional area only
- B. The temperature of the surrounding air
- C. The voltage applied to the circuit
- D. The length of the wire

10. A technician uses a lab scope to view a fuel injector waveform. A large voltage spike appears when the injector is switched off. This spike is caused by:

- A. A failed driver transistor shorting to battery
- B. The collapsing magnetic field inducing voltage in the coil
- C. A low battery voltage insufficient to power the circuit
- D. The engine control module's PWM signal reaching peak

11. Three 9-ohm resistors are connected in parallel. The total resistance of this combination is:

- A. 3 ohms of total resistance
- B. 27 ohms of series addition
- C. 9 ohms from averaging
- D. 18 ohms from parallel combination

12. A technician finds a fuse that is blown. Before replacing it, the technician should:

- A. Install a higher-rated fuse to prevent recurrence
- B. Jumper the fuse terminals with a wire temporarily
- C. Identify the cause of the fuse failure
- D. Replace the fuse block entirely for reliability

13. A soldered electrical splice inside heat-shrink tubing with an adhesive liner is:

- A. Suitable for interior locations only
- B. Approved for signal-level circuits exclusively
- C. Required for all automotive applications
- D. Suitable for underhood and exposed locations

14. An AGM battery is different from a conventional flooded battery in that:

- A. AGM produces higher voltage output at startup
- B. AGM electrolyte is absorbed into fiberglass mats between plates
- C. AGM cannot be charged with modern smart chargers
- D. AGM is only used in commercial applications

15. A battery tested at a specific gravity of 1.180 on all cells is approximately:

- A. 50 percent state of charge
- B. Fully charged at 100 percent
- C. Overcharged beyond normal levels
- D. Completely discharged, below 25 percent

16. Before jump-starting a vehicle, the technician should verify that:

- A. The batteries are of different voltages to allow charging
- B. The vehicles are parked closely together at least
- C. Both batteries are the same voltage and type
- D. The discharged battery is removed from the vehicle first

17. A starter that engages with a whining sound but does not crank the engine MOST likely has:

- A. A completely discharged battery
- B. A failed solenoid pull-in winding
- C. A shorted armature in the starter motor
- D. A failed overrunning clutch or broken pinion

18. Cold Cranking Amperes (CCA) is measured at:

- A. Room temperature for nominal rating calculations
- B. 0°F (-17.8°C) per SAE J537 specification
- C. -40°F for extreme cold conditions only
- D. 70°F under normal shop conditions

19. A parasitic draw test on a modern vehicle typically shows acceptable current draw of:

- A. 30 to 50 milliamperes after the vehicle has slept
- B. 200 to 300 milliamperes during sleep mode
- C. 500 to 800 milliamperes at all times
- D. Zero current when the ignition is off

20. Sulfation in a lead-acid battery results from:

- A. Overcharging at voltages above normal
- B. Cold temperatures during cranking only
- C. Long-term partial discharge or sitting discharged
- D. Rapid charging from a discharged state

21. A starter draws the normal current but cranks the engine slowly. The MOST likely cause is:

- A. A completely failed starter requiring replacement
- B. A normal condition for a cold engine start
- C. High resistance in the battery cables or terminals
- D. Excessive battery voltage forcing the starter

22. A conductance tester indicates a battery's CCA is 300 when its rated CCA is 600. The battery is:

- A. Significantly degraded and requires replacement
- B. Operating within normal specifications
- C. At maximum performance above nominal
- D. Recently charged and ready for service

23. The voltage regulator in a modern alternator controls output voltage by:

- A. Switching stator phases electronically at high frequency
- B. Varying the current through the rotor field winding
- C. Changing the drive belt ratio to the crankshaft pulley
- D. Modulating the main output terminal voltage directly

24. Excessive AC ripple at the battery terminals during alternator operation typically indicates:

- A. A weak drive belt slipping under load
- B. An overcharging voltage regulator setpoint
- C. A fully charged battery no longer accepting current
- D. One or more failed rectifier diodes in the alternator

25. A voltage drop test between the alternator B+ terminal and the battery positive post reads 1.0 volt. This indicates:

- A. Normal cable resistance for proper operation
- B. A failed voltage regulator in the alternator assembly
- C. Excessive resistance in the charging cable or terminations
- D. An overcharging condition requiring immediate repair

26. A computer-controlled charging system varies voltage based on:

- A. Only engine RPM with no other inputs considered
- B. Battery state of charge, temperature, and electrical load
- C. The outside air temperature reading only
- D. The fuel level in the vehicle's main tank

27. Drive belt slippage is checked by:

- A. Using a belt tension gauge or checking tensioner position
- B. Listening for squeaking sounds during engine acceleration
- C. Pressing the belt with a finger to estimate tension
- D. Measuring voltage drop across the alternator output

28. HID bulbs operate using:

- A. A heated filament similar to conventional incandescent
- B. An LED array with a special ballast circuit
- C. An arc discharge between electrodes in xenon gas
- D. A phosphor coating excited by ultraviolet radiation

29. A halogen bulb fails prematurely after professional installation. The MOST likely cause is:

- A. Incorrect wattage rating for the vehicle
- B. Voltage regulator overcharging during operation
- C. Moisture contamination during the installation
- D. Skin oils transferred during handling of the glass

30. The Center High-Mount Stop Lamp is required by:

- A. Federal Motor Vehicle Safety Standard 108
- B. State motor vehicle inspection regulations only
- C. SAE International recommended practice J2012
- D. Individual vehicle manufacturer preference

31. A turn signal on one side of a vehicle flashes at twice the normal rate. This indicates:

- A. A failed hazard flasher affecting both sides simultaneously
- B. A burned-out turn signal bulb on the fast-flashing side
- C. An open circuit in the brake light system wiring
- D. A short to ground in the dome light circuit

32. Daytime Running Lights (DRLs) typically operate at:

- A. Full headlight voltage for maximum visibility
- B. Zero volts when the engine is running normally
- C. Exactly 12 volts regardless of battery state
- D. Reduced voltage, often around 60 percent of normal

33. A failed headlight on one side only, while the other side operates normally, is MOST likely caused by:

- A. A failed bulb, socket, or wiring specific to that side
- B. An overall low battery voltage condition
- C. A completely failed charging system
- D. A short to ground in the headlight switch

34. A modern instrument cluster receives vehicle speed data from:

- A. A dedicated speed sensor hardwired to the cluster only
- B. The engine control module via the fuel injection signals
- C. A network message broadcast by the ABS module
- D. A mechanical cable driven by the transmission output

35. A warning lamp on the cluster stays illuminated after the key-on bulb check. This indicates:

- A. The bulb check is not complete yet
- B. A fault in the system the lamp monitors
- C. The lamp driver has failed in the ON state
- D. Normal operation during vehicle testing

36. A fuel level gauge reads incorrectly while driving. The sending unit tests correct, and wiring to the BCM is intact. The fault is MOST likely in:

- A. The fuel pump drawing excessive current
- B. The fuel pressure regulator limiting flow
- C. The ground connection at the battery negative
- D. The instrument cluster's fuel gauge circuit

37. A head-up display (HUD) shows a ghost image above the primary display. This indicates:

- A. A standard replacement windshield installed on a HUD-equipped vehicle
- B. A weak HUD projector requiring replacement
- C. Software corruption in the HUD control module
- D. A dirty windshield at the projection area

38. After installing a replacement instrument cluster on a modern vehicle, the vehicle fails to start. The MOST likely cause is:

- A. A blown fuse during the replacement procedure
- B. The cluster has not been programmed to the immobilizer
- C. A disconnected wiring harness at the cluster connector
- D. The battery was discharged during the replacement

39. A driver information center (DIC) displays incorrect outside air temperature. The scan tool shows correct temperature from the sensor. The fault is MOST likely in:

- A. The outside air temperature sensor hardware
- B. The wiring between the sensor and the BCM
- C. The DIC's internal data processing or display
- D. The BCM's signal conditioning for the sensor

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

- A. A defective passenger door switch or break in its wiring
- B. A failed window motor in the door assembly
- C. A blown fuse affecting the entire window system
- D. A disconnected power wire to the motor's ground

41. Pinch protection on a modern auto-up power window system works by:

- A. Using infrared sensors across the window opening path
- B. Timing the up-travel cycle against a stored maximum duration
- C. Measuring glass surface pressure via piezoelectric sensors
- D. Monitoring motor current for a spike caused by obstruction

42. A rain-sensing wiper system activates falsely on a dry sunny day. The MOST likely cause is:

- A. Contamination on the windshield where the sensor is located
- B. A failed rain sensor module requiring replacement
- C. A BCM software bug causing continuous activation
- D. A weak wiper motor with worn brushes

43. A horn sounds weakly compared to normal. The FIRST action the technician should take is:

- A. Replace the horn relay for reliable operation
- B. Increase the horn ground wire gauge size
- C. Perform voltage drop testing on the horn circuit
- D. Install a supplemental horn in parallel with the existing

44. A remote keyless entry fob works at short range but not at longer distances. The MOST likely cause is:

- A. Damage to the vehicle's keyless entry receiver
- B. A weak or depleted battery in the key fob
- C. An unsynchronized rolling code between fob and vehicle
- D. Radio frequency interference from external sources

45. Rear defogger grids with one horizontal trace not heating, while others operate normally, indicate:

- A. A failed defogger relay affecting the entire circuit
- B. A blown defogger fuse affecting the full grid
- C. A defective dashboard defogger switch assembly
- D. A broken trace on the specific non-heating line

46. Before performing service on SRS components, the technician MUST:

- A. Disconnect the battery and wait the manufacturer-specified time
- B. Scan the SRS module for DTCs with ignition on first
- C. Remove the steering wheel to access the clock spring
- D. Disconnect only the airbag deployment connectors

47. A squib connector in an SRS circuit includes a shorting bar that:

- A. Provides low-resistance continuity for module testing
- B. Measures squib resistance during normal operation
- C. Shorts the squib wires together when disconnected
- D. Reduces electromagnetic interference in the harness

48. The occupant classification system must be calibrated after:

- A. Replacing the vehicle's main 12-volt battery
- B. Any engine control module software update
- C. Work involving the brake master cylinder
- D. Any service to the front passenger seat assembly

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

- A. 120 ohms, matching a single active terminator
- B. 60 ohms, representing two parallel 120-ohm terminators
- C. 240 ohms, representing two terminators in series
- D. 30 ohms, representing three terminators in parallel

50. A U0100 diagnostic trouble code indicates:

- A. A high-voltage condition detected on the CAN bus
- B. A calibration fault in the instrument cluster hardware
- C. Lost communication with the engine control module
- D. A power supply fault in the body control module

Practice Exam 10: Answer Key and Explanations

1. D — Current equals power divided by voltage: $60 \text{ W} \div 12 \text{ V} = 5 \text{ amperes}$. This calculation applies Watt's Law inversely to determine current draw when wattage and voltage are known. Fluency with this relationship is essential for sizing fuses, evaluating wire gauges, and predicting circuit loads during diagnostic work.

2. B — Every wire, connector, and terminal has some resistance that produces voltage drop under current flow. A 1.7-volt difference between battery and load is significant voltage drop indicating excessive resistance in the wiring, connectors, or terminals. Acceptable drop is typically under 0.5 volts for most automotive circuits; readings like this require diagnosis and repair of the specific restriction.

3. A — Kirchhoff's current law states that the total current entering a node must equal the total current leaving that node. This principle reflects conservation of charge — current cannot accumulate at a point. It is the foundation for analyzing parallel circuits and understanding how current divides at junction points throughout automotive electrical systems.

4. C — A reading of 0.5 ohms on a continuity test represents good continuity through a healthy wire. Typical wiring shows very low resistance (usually under 1 ohm for short lengths). The audible beep confirms the circuit is complete. Higher readings or OL would indicate excessive resistance or an open circuit requiring repair.

5. B — Power equals current squared times resistance: $P = I^2 \times R$, so $(4)^2 \times 3 = 16 \times 3 = 48$ watts. Alternatively, using $P = E \times I$ with E calculated from Ohm's Law ($E = IR = 4 \times 3 = 12$ volts), then $12 \times 4 = 48$ watts. Both methods confirm 48 watts is dissipated by the resistor.

6. D — A short to ground creates a direct low-resistance path from power to ground, allowing excessive current that immediately blows the protective fuse. This is how protective fuses work — they interrupt the circuit before damaging currents can persist. Identifying and repairing shorts to ground is essential before replacing blown fuses; otherwise, new fuses will blow immediately.

7. A — Incandescent test lights draw 150-300 milliamperes, which is sufficient to damage sensor output drivers and module input circuits designed for microampere-range signals. Technician B is wrong; logic probes drawing less than 1 milliampere are the proper tool for testing modern automotive electronic circuits. Understanding which tool is safe for which circuit type is essential.

8. C — The standard wire color code convention lists the base color first and the tracer stripe second. "WH/RD" indicates a white base color with a red tracer stripe. This notation appears throughout service information and is essential for identifying the correct wire within a harness bundle during diagnostic and repair work.

9. D — Resistance in a conductor is directly proportional to length — longer wire has more resistance than shorter wire of the same gauge. Resistance is inversely proportional to cross-sectional area (thicker

wire has less resistance) and directly proportional to temperature (hotter wire has more resistance). Length is one of the four factors affecting conductor resistance.

10. B — When current to an inductive load like a fuel injector is interrupted, the collapsing magnetic field induces a large voltage spike of opposite polarity — typically 60-100 volts on a fuel injector. This inductive kick is a normal characteristic of inductive switching, not a fault. Clamping diodes are often used to limit this voltage where necessary.

11. A — Three equal parallel resistors combine to $R \div N$, where N is the number of resistors. Three 9-ohm resistors in parallel produce $9 \div 3 = 3$ ohms. This formula applies only when all parallel resistors are equal. Parallel combinations always produce less total resistance than the smallest individual resistor in the combination.

12. C — Before installing a new fuse, the technician must identify why the original fuse blew. Fuses blow because of a fault — typically a short to ground, a shorted component, or sustained overload. Installing a replacement without addressing the cause simply wastes another fuse and may cause additional damage when the fault causes another failure.

13. D — Heat-shrink tubing with an adhesive liner combines mechanical crimp protection with thermoplastic environmental sealing when heated. The adhesive flows and seals against moisture intrusion, producing a splice suitable for underhood and exposed locations. Non-adhesive heat-shrink provides only mechanical protection and is limited to interior locations.

14. B — AGM (Absorbed Glass Mat) batteries replace the free liquid electrolyte of flooded batteries with electrolyte absorbed into compressed fiberglass mats between the plates. The chemistry remains lead-acid; only the physical form of the electrolyte changes. This provides superior vibration resistance, spill-proof construction, and better deep-cycle performance than flooded designs.

15. A — A specific gravity of 1.180 indicates approximately 50% state of charge. The scale is: 1.265-1.280 = fully charged, 1.230 = 75%, 1.180 = 50%, 1.130 = 25%, below 1.100 = essentially discharged. Recharging to full and retesting determines overall battery condition. A 50%-charged battery is not defective, simply discharged.

16. C — Before jump-starting, verify that both batteries are the same voltage system (typically 12 volts) and chemistry type. Mismatched voltage systems can damage electronics; different chemistries may have different charging characteristics. Some modern start-stop vehicles have specific jump-start

restrictions — always check service information before jumping vehicles with complex electrical systems.

17. D — A starter that engages (solenoid activates, pinion extends) but produces a whining sound without cranking indicates the pinion is spinning without transferring torque to the flywheel. A failed overrunning clutch allows the starter armature to spin without driving the pinion, or the pinion itself is broken. Starter replacement or overhaul is required.

18. B — Cold Cranking Amperes is measured at 0°F (−17.8°C) per SAE J537 specification. This temperature simulates worst-case cold-start conditions when battery chemistry is slowest and engine oil is thickest. The 30-second test at rated CCA while maintaining 7.2 volts establishes the battery's cold-weather performance capability — critical knowledge for the A6 exam.

19. A — Parasitic draw specifications for modern vehicles are typically 30-50 milliamperes after the vehicle has fully entered sleep mode. A reading of 200+ mA indicates a module or circuit is not properly entering low-power state. Excessive draw discharges the battery over several days of parking, creating the typical "battery dies overnight" customer complaint.

20. C — Sulfation develops when a battery remains in a partially discharged state for extended periods. 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 this damage.

21. C — A starter drawing normal current but cranking slowly indicates the starter is receiving inadequate voltage due to voltage drop in the supply cables or ground path. Voltage drop testing during cranking reveals the specific location of unwanted resistance. The starter itself is functioning correctly; the supply circuit needs attention. Cleaning corroded terminals often resolves this.

22. A — A battery measuring only 50% of rated CCA (300 of 600) is significantly degraded and requires replacement. The typical acceptable threshold is 80% of rated CCA; 50% is well below acceptable and indicates internal deterioration too severe for reliable service. Replacement is required; the battery cannot reliably support vehicle starting.

23. B — The voltage regulator controls alternator output by varying the current through the rotor field winding. Stronger field current creates a stronger magnetic field, which induces higher voltage in the

stator. Weaker field current reduces output voltage. This electrical field control enables voltage regulation independent of RPM and load conditions.

24. D — A healthy alternator produces less than 100 millivolts of AC ripple at the battery terminals. Excessive AC ripple indicates one or more failed rectifier diodes — the diodes that convert three-phase AC to DC have lost their ability to prevent AC from reaching the output. This requires alternator replacement before excess ripple damages other vehicle electronics.

25. C — A 1.0-volt drop across the charging cable is excessive (typical specification is under 0.5 volts). This indicates corroded connections, damaged wire, or loose terminals. Many "alternator failures" are actually cable problems — voltage drop testing prevents unnecessary alternator replacement when the wiring is the actual fault. Fixing the cable often resolves the charging complaint.

26. B — Modern computer-controlled charging systems vary voltage based on multiple inputs: battery state of charge (sensed by battery sensors or estimated by models), battery temperature (affecting chemistry), and electrical load. The system balances charging rate against battery health and fuel economy. This adaptive behavior produces voltage values that may appear incorrect without understanding the strategy.

27. A — Modern belt tensioners have pointers or indicators that show correct tension range. For non-tensioner belts, tension is checked with a belt tension gauge. Pressing with a finger is not reliable enough to verify correct tension; listening for squeaks is reactive rather than preventive. Proper tension verification is essential before returning the vehicle to service.

28. C — HID (high-intensity discharge) headlights produce light by establishing an electric arc between two electrodes inside a xenon-filled capsule. The arc ionizes metal halide salts, producing brilliant bluish-white light at efficiency several times higher than halogen. This requires high-voltage ballasts that generate 15,000+ volt ignition pulses to strike the arc initially.

29. D — Skin oils transferred during handling create thermal stress concentration points on halogen bulb glass envelopes, causing premature failure. This is the single most common cause of early halogen bulb failure. Proper installation technique (handling by base or with clean cloth, and cleaning any finger contact with isopropyl alcohol) prevents this problem and allows normal service life.

30. A — The Center High-Mount Stop Lamp (CHMSL) is required by Federal Motor Vehicle Safety Standard (FMVSS) 108, which regulates all vehicle exterior lighting and signaling. CHMSL has been

required on all U.S. passenger cars since 1986 and on light trucks since 1994 as a safety measure to reduce rear-end collisions by providing an additional brake signal visible to following drivers.

31. B — A fast-flashing turn signal on one side is the flasher circuit's deliberate fault indicator, designed to alert the driver that one of the turn signal bulbs on that side has failed. The reduced current load from the burned-out bulb triggers the flasher to accelerate its flash rate. Replacing the failed bulb on the fast-flashing side restores normal flash rate.

32. D — Daytime Running Lights typically operate the headlight filaments at reduced voltage (around 60-70% of normal voltage), producing dimmer output than high beams while providing daytime visibility. Some implementations use dedicated DRL lamps or operate fog lights at reduced intensity. The dimmer output provides daytime visibility without the full glare of normal headlights.

33. A — A single-side headlight failure, with the other side operating normally, isolates the fault to the non-working side's specific components — bulb, socket, wiring, or ground. The other side's normal operation confirms the switch, fuse, and shared power feed are all functional. Diagnosis targets only the failed side's components.

34. C — Modern instrument clusters receive vehicle speed data as a network message broadcast by the ABS module that reads wheel speed sensors. The ABS module calculates vehicle speed from wheel rotation data and transmits it on the CAN bus, where the cluster receives it and renders the speedometer display. This centralized architecture replaced mechanical speed cables on modern vehicles.

35. B — A warning lamp illuminated after the key-on bulb check indicates a fault in the system the lamp monitors — the commanding module is actively requesting the lamp remain on because the condition persists. This is distinct from a lamp that fails to illuminate during bulb check (which indicates a lamp-circuit fault). Understanding this distinction is critical for diagnosis.

36. D — If the sending unit tests correct and wiring to the BCM is intact, but the cluster displays incorrectly, the fault must be in the cluster itself. Modern clusters include internal electronic processing of fuel gauge signals that can fail independently of external components. Cluster repair or replacement is typically required to address these internal electronic failures.

37. A — HUD-equipped vehicles require a special windshield with a wedge-shaped PVB inner layer that prevents ghost imaging. A standard replacement windshield reflects the projected image from both

inner and outer glass surfaces, creating the characteristic "ghost" double image. Replacement with the correct HUD-compatible glass is the only fix for this problem.

38. B — Modern clusters store immobilizer authentication data that must match other vehicle modules. A replacement cluster not properly programmed to the vehicle is rejected by the immobilizer, which denies the engine-enable signal and prevents starting. Programming or pre-programmed cluster supply is required on modern vehicle cluster replacement; a simple physical swap alone is insufficient.

39. C — If the scan tool shows correct data from the sensor but the DIC displays incorrect information, the data is reaching the DIC correctly but something in its internal processing or display has failed. This isolates the problem to the DIC itself. The sensor and upstream modules are functioning; the DIC's internal electronics are the fault.

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

41. D — Modern pinch protection monitors motor current through the H-bridge driver during up-travel. An obstruction causes a sudden current spike that the module detects and immediately reverses motor direction to prevent injury. This function is federally mandated on auto-up windows and protects occupants from pinching hazards. Current monitoring is the most practical and responsive sensing method.

42. A — Rain-sensing wiper systems interpret changes in infrared light reflection from the windshield. Dirt, grime, or residue on the glass in the sensor area absorbs or scatters infrared light, mimicking water droplets and falsely activating the wipers. Cleaning the windshield in the sensor area resolves this common nuisance complaint without any repair to the system itself.

43. C — Reduced horn volume indicates voltage drop somewhere in the horn circuit — corroded ground, degraded wire, or failing switch contacts. Voltage drop testing from the battery positive to the horn connector during operation reveals the location of unwanted resistance. The horn itself is rarely the fault when volume is merely reduced; wiring and grounds are typically the cause.

44. B — A fob working at short range but failing at longer distances is the classic signature of a weak battery. The transmitter output is reduced, shortening effective range progressively. This is the simplest

and most common RKE complaint; battery replacement almost always restores normal range. Try this before proceeding to receiver or programming diagnosis.

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

46. A — Every SRS requires a manufacturer-specified disabling procedure including battery disconnection and a waiting period (typically 1-10 minutes) for deployment-energy capacitors to discharge. Accidental airbag deployment during service causes severe injury. Scanning DTCs or disconnecting only the airbag connector is not sufficient; the full system must be de-energized before physical service.

47. C — 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 airbag deployment. When the connector reconnects, the bar retracts to allow normal operation. This is a critical safety feature during service.

48. D — The occupant classification system must be calibrated after any service involving the passenger seat — cushion replacement, cover changes, sensor repair, or mat replacement. Uncalibrated systems may misclassify occupants (child as adult or empty as occupied), making dangerous airbag deployment decisions. This safety-critical calibration must be performed before returning the vehicle to service.

49. B — 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 measurement is a fundamental CAN diagnostic check; significant deviation indicates missing or shorted terminators or wire faults.

50. C — The U0100 code specifically indicates lost communication with the engine control 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; a single U0100 suggests the ECM is offline, in bus-off state, or has lost its network connection.