

# PRACTICE EXAM 9: ASE A6 SIMULATION (50 QUESTIONS)

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1. A 24-watt bulb operates at 12 volts. What is the current draw of this bulb?
  - A. 2 amperes during operation
  - B. 288 amperes at peak
  - C. 0.5 amperes of current
  - D. 12 amperes total
  
2. A circuit has two 10-ohm resistors in parallel connected to a 10-volt source. What is the current drawn from the source?
  - A. 0.5 amperes through the circuit
  - B. 1 ampere at steady state
  - C. 10 amperes at peak
  - D. 2 amperes total
  
3. A technician reading a wire color code of "GY/OR" interprets the wire as having:
  - A. An orange base color with a gray primary stripe
  - B. A gray base color with an orange tracer stripe
  - C. Two bundled wires, gray and orange together
  - D. A solid gray wire with no tracer markings
  
4. Ohm's Law, when solved for voltage, states:

- A.  $E = R \div I$  (voltage equals resistance divided by current)
- B.  $E = R + I$  (voltage equals resistance plus current)
- C.  $E = I \times R$  (voltage equals current times resistance)
- D.  $E = I \div R$  (voltage equals current divided by resistance)

5. A technician observes an electrical circuit that appears to operate intermittently when the harness near a door hinge is moved. This indicates:

- A. A normal condition in door-to-body wiring
- B. A software glitch in the body control module
- C. Ambient temperature affecting the connectors
- D. A broken wire inside the insulation at the flex point

6. Two resistors of 4 ohms and 8 ohms are connected in series to a 12-volt battery. The current through the circuit is:

- A. 1 ampere of current
- B. 3 amperes total
- C. 12 amperes at steady state
- D. 0.33 amperes through the circuit

7. A technician is testing a circuit using a logic probe instead of a test light because:

- A. Logic probes are faster to use for basic testing
- B. Test lights draw too much current for electronic circuits
- C. Logic probes are required by federal safety standards
- D. Logic probes measure resistance more accurately

8. The schematic symbol for a resistor typically appears as:

- A. A circle with an "R" inside the boundary
- B. A triangle pointing to a vertical line segment
- C. A series of parallel horizontal lines stacked vertically
- D. A zigzag line or rectangular box

9. A soldered splice sealed with adhesive-lined heat-shrink tubing is:

- A. Limited to use in interior-only locations
- B. Approved only for signal-level circuits at low current
- C. Suitable for underhood and exposed locations with moisture
- D. Required only for SRS circuits under current safety rules

10. A technician observes that a lab scope waveform shows a 0-to-5 volt square wave with 60% on-time. The duty cycle is:

- A. 60 percent of full duty cycle
- B. 40 percent of normal output
- C. 50 percent at mid-range operation
- D. 100 percent of continuous output

11. Kirchhoff's voltage law states that:

- A. Current entering a node equals current leaving the node
- B. Resistance is inversely proportional to cross-sectional area
- C. The sum of voltage drops around a closed loop equals zero
- D. Power dissipated is directly proportional to voltage squared

12. A technician measuring voltage at the battery with the engine running sees 13.8 volts. This indicates:

- A. Normal charging system operation at moderate load
- B. An overcharging condition requiring alternator replacement
- C. A completely discharged battery unable to accept charging
- D. A failed voltage regulator producing incorrect output

13. A digital multimeter measuring current in a circuit requires:

- A. Placing the meter in parallel with the load being tested
- B. Breaking the circuit and connecting the meter in series
- C. Connecting the meter to the chassis ground reference point
- D. Using the voltage jacks with auto-ranging enabled

14. A battery's rest voltage after 24 hours of non-use reads 12.0 volts. The battery state of charge is approximately:

- A. 100 percent, fully charged
- B. 75 percent charge state
- C. 50 percent charge state
- D. 25 percent, significantly discharged

15. The primary reason AGM batteries are used in start-stop vehicle applications is:

- A. They tolerate repeated deep-cycle discharge better than flooded batteries
- B. They produce higher output voltage during cold starts
- C. They are significantly less expensive than flooded alternatives
- D. They require no maintenance for the life of the vehicle

16. A starter that does not engage when the key is turned to START position and produces no sound or action is MOST likely caused by:

- A. A failed starter solenoid pull-in winding
- B. A broken flywheel ring gear on the engine side
- C. An open circuit in the starter control circuit
- D. A normal no-start condition for cold engines

17. A conductance tester reports a battery's CCA as 350, while the rated CCA is 550. This indicates:

- A. The battery exceeds its original specification
- B. The battery has degraded and needs replacement
- C. A calibration error in the conductance tester
- D. Normal aging within the warranty period

18. Before performing a parasitic draw test, the technician should:

- A. Fully discharge the battery for accurate measurement
- B. Disconnect the alternator to prevent interference
- C. Remove all fuses from the vehicle's fuse panels
- D. Allow the vehicle to sleep for at least 30 minutes

19. A starter cranking test shows 320 amperes during cranking on a vehicle rated for 180 amperes. This indicates:

- A. Starter internal damage such as shorted windings or binding
- B. A normal cold-start current draw for large engines
- C. A healthy starter operating at peak efficiency
- D. Excessive battery voltage forcing overcurrent

20. Battery registration on a modern vehicle with BCM-controlled charging is required to:

- A. Verify the battery's warranty activation date
- B. Confirm the battery's group size for the tray
- C. Update the BCM's charging strategy for the new battery
- D. Register the vehicle for emissions compliance tracking

21. A battery load test is performed at what percentage of CCA rating?

- A. 25 percent of the rated cold cranking amperes
- B. 50 percent of the rated cold cranking amperes
- C. 75 percent of the rated cold cranking amperes
- D. 100 percent of the rated cold cranking amperes

22. The nominal voltage of a fully charged 12-volt battery with six cells is:

- A. 14.4 volts at peak
- B. 13.8 volts during charging
- C. 12.6 volts at rest
- D. 10.5 volts under load

23. A customer's vehicle shows a charging warning lamp that illuminates intermittently. The FIRST diagnostic step should be:

- A. Inspect the drive belt for glazing, cracks, or slippage
- B. Replace the alternator as the most common cause
- C. Scan the engine control module for all stored DTCs
- D. Measure the alternator output current at maximum load

24. Three-phase AC output from an alternator is converted to DC using:

- A. A single high-power bipolar transistor
- B. A transformer followed by a filter capacitor network
- C. The battery's chemical reaction during charging
- D. Six rectifier diodes arranged as a full-wave bridge

25. An overrunning alternator pulley (OAP) with a failed clutch will cause:

- A. Constant overcharging at all engine speeds
- B. Increased belt noise, particularly at idle or deceleration
- C. Loss of all AC ripple on the charging system output
- D. A U-code DTC in the engine control module

26. A voltage drop test on a charging system positive cable reads 0.7 volts. This indicates:

- A. Normal cable resistance within specification
- B. A failed voltage regulator in the alternator
- C. Excessive resistance requiring cable or termination repair
- D. A completely broken wire in the charging circuit

27. A computer-controlled charging system commands lower voltage during periods when:

- A. The battery is detected as fully charged and driving conditions are stable
- B. The vehicle electrical load exceeds alternator capacity limits
- C. Engine RPM drops below the minimum alternator cut-in speed
- D. The ambient air temperature is below freezing temperatures

28. A halogen headlight fails within hours of a professional installation. The MOST likely cause is:

- A. Incorrect wattage rating installed on the vehicle
- B. Voltage regulator overcharging during the first drive
- C. Defective bulb from the manufacturer's assembly
- D. Skin oil contamination during installation handling

29. HID (xenon) headlights achieve full brightness in approximately:

- A. Less than 100 milliseconds immediately upon activation
- B. 10 to 30 seconds after initial ignition of the arc
- C. 2 to 3 minutes of continuous operation required
- D. 30 to 60 seconds after warm-up starts completing

30. The Center High-Mount Stop Lamp (CHMSL) functions:

- A. As a combined tail and brake lamp simultaneously
- B. Continuously whenever the headlight switch is on
- C. Only during brake pedal application, not as a tail lamp
- D. As a reverse indicator when the transmission is in REVERSE

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

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

32. An aftermarket LED bulb installed in place of a halogen causes hyper-flashing because:

- A. The LED's reduced current draw is interpreted as a burned-out bulb
- B. The LED's polarity is reversed from halogen specifications
- C. The LED produces excessive heat causing flasher tripping
- D. The LED's color temperature differs from halogen standards

33. FMVSS 108 regulates:

- A. Vehicle emissions standards for light-duty passenger cars
- B. Battery manufacturer safety and production requirements
- C. Motor vehicle exterior lighting and signaling requirements
- D. Catalytic converter efficiency for emission compliance

34. A modern instrument cluster displays engine coolant temperature from:

- A. A dedicated sensor wired directly to the cluster module
- B. A network message broadcast from the engine control module
- C. A mechanical capillary tube linked to the engine coolant passage
- D. The cluster's internal temperature reference and lookup table

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

- A. The lamp driver has failed in the illuminated state
- B. The bulb check test is still in progress for normal duration
- C. The cluster backlight is compensating for low battery voltage
- D. A fault exists in the system the lamp monitors

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

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

37. When replacing an instrument cluster on a modern vehicle, federal law requires that:

- A. The old cluster be preserved for future service reference
- B. The new cluster be flashed with the manufacturer's latest firmware
- C. The odometer reading on the new cluster match the original
- D. The cluster configuration file be backed up to the scan tool

38. A HUD (head-up display) shows a clear primary image with a faint ghost image above it. This indicates:

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

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

- A. The outside air temperature sensor itself
- B. The wiring between the sensor and the BCM
- C. The outside temperature broadcasting module
- D. The DIC's internal data reception or display circuits

40. A power window does not operate from either switch. The master switch has voltage at its input. The MOST likely cause is:

- A. A failed window motor or open wire between motor and switch
- B. A disconnected power wire to the master switch module
- C. A malfunction in the hazard flasher circuit affecting windows
- D. A stuck or misaligned window pinch-protection sensor

41. A power door lock actuator works from the fob but not from the interior switch. The MOST likely cause is:

- A. A completely failed lock actuator requiring replacement
- B. A defective interior switch or break in its wiring to the module
- C. A blown fuse affecting both fob and switch commands equally
- D. An unsynchronized rolling code between the fob and module

42. A rain-sensing wiper system activates falsely on a dry sunny day. The FIRST action the technician should take is:

- A. Replace the rain sensor module with a new component
- B. Disable the rain-sensing function through the infotainment menu
- C. Clean the windshield area where the rain sensor is located
- D. Scan the BCM for stored DTCs related to the rain sensor

43. A horn that does not operate is traced to a failed horn relay. The technician's next step should be:

- A. Replace the relay and verify horn operation afterward
- B. Test the horn switch at the steering wheel for continuity
- C. Measure the current draw of the horn during operation

D. Inspect the ground point for corrosion and clean if needed

44. A remote keyless entry fob has been replaced with a new unit. Before it will operate vehicle functions, the fob must be:

- A. Activated by pressing any button on the fob near the vehicle
- B. Programmed to the vehicle using manufacturer-specific procedures
- C. Synchronized by driving the vehicle for ten minutes continuously
- D. Registered with the manufacturer through an online portal

45. A rear defogger has one trace that does not heat while others operate normally. The fault is in:

- A. The specific broken trace on the glass surface
- B. The dashboard defogger switch and its indicator lamp
- C. The defogger relay supplying power to the entire grid
- D. The body control module timer logic for the defogger

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

- A. Scan the SRS module for stored DTCs first
- B. Discharge the clock spring by turning the steering wheel
- C. Disconnect only the airbag deployment connectors
- D. Disconnect the battery and wait the manufacturer-specified time

47. A squib connector in an airbag system includes a shorting bar that:

- A. Provides a low-resistance reference for module testing
- B. Measures the squib resistance during normal operation
- C. Automatically shorts the squib wires when disconnected to prevent deployment

D. Reduces electromagnetic interference from the squib wiring harness

48. The occupant classification system determines deployment strategy for:

- A. The driver's airbag during severe frontal impacts only
- B. The front passenger airbag based on occupant weight and characteristics
- C. The side curtain airbags during rollover events
- D. The seatbelt pretensioner timing during side impacts

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

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

50. A gateway module in a modern vehicle is responsible for:

- A. Storing all diagnostic trouble codes from each module
- B. Distributing 12-volt power to body electrical systems
- C. Terminating the CAN bus at both its physical endpoints
- D. Translating messages between different vehicle networks

## Practice Exam 9: Answer Key and Explanations

1. A — Current equals power divided by voltage:  $24 \text{ W} \div 12 \text{ V} = 2 \text{ amperes}$ . This calculation applies Watt's Law inversely to determine current draw when wattage and voltage are known. Understanding this relationship is essential for sizing fuses, evaluating wire gauges, and predicting circuit loads during diagnostic work.

2. D — Two 10-ohm resistors in parallel combine to 5 ohms ( $10 \div 2$ ). Applying Ohm's Law,  $I = E \div R$ , so  $10 \text{ volts} \div 5 \text{ ohms} = 2 \text{ amperes}$ . Parallel combinations always reduce total resistance and increase total current draw, a key concept for understanding automotive electrical bus loading and circuit analysis.

3. B — The standard wire color code convention lists the base color first and the tracer stripe second. "GY/OR" indicates a gray base color with an orange 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.

4. C — Ohm's Law solved for voltage is  $E = I \times R$  (voltage equals current times resistance). The three forms of Ohm's Law are  $E = I \times R$ ,  $I = E \div R$ , and  $R = E \div I$ . Fluency with rearranging this equation to solve for any unknown is essential for virtually every automotive electrical diagnostic calculation.

5. D — A circuit that responds to physical movement of wiring near flex points (door hinges, trunk hinges, steering columns) indicates a broken wire inside the insulation at the flex point. The copper conductors fatigue from repeated flexing and break while the insulation remains intact. This is a common failure mode that requires harness inspection or repair.

6. A — Series resistances add directly:  $4 + 8 = 12$  ohms total resistance. Applying Ohm's Law,  $I = E \div R$ , so  $12 \text{ volts} \div 12 \text{ ohms} = 1 \text{ ampere}$ . In a series circuit, current is the same throughout — it flows in one path through each component in sequence. Recognizing series circuit behavior is foundational to circuit analysis.

7. B — Incandescent test lights draw 150–300 milliamperes, enough to damage sensor output drivers and module input circuits designed for microampere signals. Logic probes draw less than 1 milliampere and are safe for use on all circuits. Modern vehicles' electronic circuits require the lower-current load of a logic probe for diagnostic testing.

8. D — The standard schematic symbol for a resistor is either a zigzag line (older ANSI symbol) or a rectangular box (newer IEC symbol). These are the internationally recognized symbols that appear throughout wiring diagrams and schematics. Recognizing these symbols is fundamental to reading any automotive wiring diagram effectively.

9. C — Heat-shrink tubing with an adhesive liner combines crimp mechanical connection with thermoplastic environmental sealing, producing a splice suitable for underhood and exposed locations.

The adhesive flows when heated and seals against moisture intrusion. Non-adhesive heat-shrink provides mechanical protection only and is limited to interior locations with minimal moisture exposure.

10. A — Duty cycle is the percentage of each cycle that the signal is on (high). A signal that is on 60% of the time has a 60 percent duty cycle. This interpretation applies to PWM fuel injectors, alternator field control, and many other automotive applications where duty cycle measurement provides diagnostic information about circuit operation.

11. C — Kirchhoff's voltage law states that the sum of voltage drops around any closed loop must equal zero. The source voltage is divided among the components, and everything balances when summed. This principle underlies series circuit analysis and explains why individual voltage drops across components must sum exactly to the source voltage.

12. A — A reading of 13.8 volts with the engine running is normal charging system output at moderate electrical load. Typical charging system voltage ranges from 13.8 to 14.7 volts depending on load, temperature, and battery state of charge. Voltages above 15 volts indicate overcharging; values below 13.8 volts suggest insufficient charging under typical conditions.

13. B — Current measurement requires breaking the circuit and connecting the meter in series so all current flows through the meter. Connecting an ammeter in parallel creates a near-short circuit and typically blows the meter's internal fuse. This is one of the most common DMM operating errors and understanding proper current measurement is essential.

14. D — A battery rest voltage of 12.0 volts indicates approximately 25% state of charge. The voltage-to-SOC relationship for lead-acid batteries is: 12.6+ V = 100%, 12.4 V = 75%, 12.2 V = 50%, 12.0 V = 25%, and below 11.9 V = essentially discharged. A battery at 25% charge should be fully charged before testing state of health.

15. A — AGM batteries tolerate repeated deep-cycle discharge far better than conventional flooded batteries, making them ideal for start-stop applications where the battery is repeatedly discharged during engine-off periods. Start-stop cycles would quickly destroy a flooded battery. The enhanced durability of AGM construction is why OEMs specify AGM for this application.

16. C — A starter that does not engage and produces no sound indicates the solenoid is not receiving its control signal. An open circuit in the control circuit — a failed starter relay, open ignition switch

contacts, or broken control wiring — prevents the solenoid from activating. Component-level testing identifies the specific failure point.

17. B — A conductance tester result significantly below rated CCA (350 reported vs. 550 rated) indicates the battery has degraded beyond acceptable limits. Approximately 80% of rated CCA is typically the minimum acceptable threshold; 350 out of 550 is only 64%. Replacement is required; a battery this far below specification cannot reliably support vehicle starting.

18. D — Parasitic draw testing requires the vehicle to be in its fully asleep state with all modules having settled into their low-power modes. Allowing at least 30 minutes of sleep time ensures all modules have completed their shutdown sequences and normal standby current is established. Testing too soon produces inflated readings that include module wake-up activity.

19. A — A starter drawing nearly twice its normal current indicates starter internal damage — typically binding bushings, a dragging armature, or partial shorts in the field or armature windings. This excess draw suggests mechanical or electrical internal problems. Starter replacement is typically required; rebuilding starters is increasingly uncommon due to the availability of remanufactured units.

20. C — Battery registration informs the BCM that a new battery has been installed so its charging strategy can be updated. The BCM maintains a charging profile calibrated to the old battery's characteristics; without registration, this outdated profile continues to be applied to the new battery, potentially leading to premature failure through improper charging.

21. B — A battery load test per SAE J537 is performed at 50 percent of the rated cold cranking amperes for 15 seconds at 70°F. The battery must maintain at least 9.6 volts at the end of the test to pass. This standardized procedure simulates realistic starter demand and reveals batteries with excessive internal resistance.

22. C — A fully charged 12-volt lead-acid battery at rest produces approximately 12.6 volts at the terminals. This is the reference for state-of-charge testing. Charging voltages of 13.8–14.7 volts indicate active charging; under-load voltages below 10.5 volts indicate severe discharge. Rest voltage is measured after surface charge dissipates.

23. A — Drive belt slippage is the most common cause of apparent charging complaints and should be inspected first. A glazed, cracked, or loose belt transfers less torque to the alternator, reducing output.

Belt inspection takes less than a minute and eliminates or confirms this inexpensive cause before proceeding to more complex electrical diagnosis that may be unnecessary.

24. 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 produces the smooth DC output for vehicle loads.

25. B — A failed one-way clutch in an overrunning alternator pulley (OAP) removes the rotational decoupling that absorbs engine speed fluctuations. This causes increased belt noise, particularly during idle and deceleration when speed fluctuations are most pronounced. The noise typically presents as a rattling or tapping sound from the alternator area.

26. C — A voltage drop of 0.7 volts on a charging cable is excessive (typical specification is under 0.5 volts). This indicates corroded connections, damaged wire, or loose terminals causing high resistance. Many "alternator failures" are actually cable problems — voltage drop testing prevents unnecessary alternator replacement when the wiring is the actual fault.

27. A — Modern computer-controlled charging systems intentionally reduce voltage when the battery is detected as fully charged and driving conditions are stable. This conserves fuel by reducing alternator load and protects the battery from overcharging. Technician A correctly identifies this as normal adaptive behavior, not a fault condition requiring repair.

28. 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.

29. B — 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 warm-up period is normal and inherent to HID technology, not a fault condition. LED and halogen technologies reach full brightness much faster — HID's warm-up is characteristic of this light source type.

30. C — The Center High-Mount Stop Lamp functions only during brake pedal application — it is not a tail lamp. This distinguishes it from the other rear lamps which illuminate continuously with headlights.

CHMSL has been required on all U.S. passenger cars since 1986 per FMVSS 108 and provides a critical third brake signal visible to following drivers.

31. D — 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 restores normal flash rate.

32. A — LED bulbs draw substantially less current than halogen bulbs of the same function. Thermal or electronic flashers interpret this lower current as a burned-out bulb condition, accelerating the flash rate to alert the driver. The fix is either an LED-compatible flasher module, a load-resistor kit, or an OEM-designed LED assembly compatible with the vehicle's factory flasher.

33. C — FMVSS 108 establishes comprehensive requirements for vehicle exterior lighting and signaling — headlights, tail lights, signal lamps, brake lights, CHMSL, and side markers. It specifies photometric output, beam patterns, mounting locations, and color requirements. Aftermarket lighting modifications must comply with FMVSS 108 to be legal for road use in the United States.

34. B — Modern instrument clusters receive engine data as network messages broadcast by the engine control module. The ECM reads the coolant temperature sensor, processes the signal, and transmits the value on the CAN bus. The cluster receives this message and renders the display accordingly. Direct sensor-to-cluster wiring is largely obsolete on modern vehicles.

35. D — 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. A — If the sending unit and wiring test correctly, but the cluster displays incorrect values, the fault is 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; aftermarket alternatives may be available for some applications.

37. C — Federal law prohibits odometer tampering. A replacement cluster must be programmed to match the original cluster's mileage reading exactly. This preserves legal compliance and maintains

vehicle value by accurately representing cumulative miles driven. Setting to zero, adjusting by market factors, or any other modification creates legal exposure and is prohibited.

38. B — 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.

39. D — The DIC faithfully displays data received over the vehicle network. If the scan tool shows correct data from the sensor, the data is being transmitted correctly on the network. The DIC's internal reception or display circuits are the fault, not the sensor or the broadcasting module. Diagnosis targets the DIC's internal processing.

40. A — A window that does not operate from either switch, but has voltage at the master switch input, indicates the switching is receiving power but the fault is downstream. The motor or the wiring between the master switch (through the door module) and the motor is the likely problem. Testing at the motor terminals isolates the specific fault.

41. B — The lock actuator responds to fob commands, confirming the actuator, wiring, and module output are all functional for the fob command path. A separate switch input isn't reaching the module. A defective interior switch or broken wiring between the switch and the door module is the most likely cause, confirmed by testing the switch circuit.

42. C — 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 is the correct first step and resolves this common nuisance complaint without any repair.

43. D — A failed horn relay confirmed through diagnosis must be replaced. However, ground corrosion and wire problems often cause or contribute to relay failures, and replacement alone may not fully resolve the underlying issue. Inspecting and cleaning the ground point ensures the replacement relay will operate correctly and the horn circuit will provide reliable service.

44. B — Key fobs must be cryptographically paired with the vehicle using manufacturer-specific programming procedures. Simply pressing buttons will not activate an un-programmed fob.

Programming typically requires a scan tool with the correct vehicle coverage or dealer-level access. Salvage fobs cannot be used without proper programming to the specific vehicle.

45. A — 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. D — 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, turning the steering wheel, or disconnecting only the airbag connectors is not sufficient — the full system must be de-energized.

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. B — The occupant classification system (OCS) determines airbag deployment strategy specifically for the front passenger airbag based on occupant weight, position, and characteristics. Proper classification allows appropriate airbag suppression for child seats, small occupants, or unoccupied seats. OCS does not directly control driver airbag, curtain, or other restraint deployment logic.

49. A — 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 fundamental CAN diagnostic check; significant deviation indicates missing, damaged, or shorted terminators.

50. D — Gateway modules translate messages between different network types — high-speed CAN to low-speed CAN, forwarding relevant data to LIN sub-networks, routing between CAN and Ethernet for cameras and ADAS. Without gateways, modern vehicles with multiple network protocols could not coordinate their systems. Gateway failures produce widespread symptoms across apparently unrelated systems.