

PRACTICE EXAM 9: ASE L4 SIMULATION (50 QUESTIONS)

1. A scan tool reports that the ADAS Central Module and the forward camera are both communicating correctly, but a pattern of sporadic feature disablement suggests communication issues between the two. The measurement that best distinguishes between a pathway fault and module internal failure is:

- A. Oscilloscope waveform of the CAN bus showing bidirectional signal quality between the modules
- B. Continuity testing between the modules with the bus in the powered-down state
- C. A visual inspection of the wiring harness from one module to the other module
- D. Scan tool diagnostic counts of communication errors during a normal drive cycle

2. Which of the following most accurately describes the relationship between the ADAS Central Module and the Electronic Power Steering Module during active lane keep assistance?

- A. The forward camera communicates directly with the Electronic Power Steering Module to command steering
- B. The ADAS Central Module drives the steering motor through a dedicated hardwired pathway
- C. The ADAS Central Module issues torque requests to the EPS module, which then translates them into motor commands
- D. The Gateway Module intercepts all steering requests before forwarding them to the steering actuator

3. A technician sees a data stream showing sustained battery voltage at 14.2 volts while the engine runs. This reading during ADAS operation best indicates:

- A. A potentially dangerous over-charging condition requiring immediate service of the alternator
- B. Normal alternator output voltage supporting typical ADAS module operating requirements

- C. Insufficient voltage for most ADAS modules to function correctly during driving
- D. An indication that the battery has completely failed and requires immediate replacement

4. A pre-repair scan shows U-code history codes on all CAN networks in a vehicle. The scan also shows that current ignition state has not refreshed any of these codes. The most productive interpretation is:

- A. Every module in the vehicle has failed simultaneously and requires complete replacement
- B. The codes are unrelated to the current complaint and can be ignored for the repair
- C. The scan tool is misreporting codes that are actually current faults in the system
- D. A past event triggered the codes, which have not recurred — investigate when and why

5. The primary diagnostic purpose of comparing pre-repair and post-repair scan results is to:

- A. Verify which codes the repair resolved and identify any codes newly introduced during service
- B. Document exact scan tool software versions used during the service event
- C. Calculate the total labor hours required to complete the repair workflow
- D. Provide a detailed record for the warranty department during claim processing

6. On the composite vehicle, the public ADAS CAN bus carries which type of traffic most frequently?

- A. Raw video streams from each of the four surround view cameras simultaneously
- B. High-bandwidth radar point cloud data from the corner radar modules in real time
- C. Cellular modem configuration data from the Telematics Control Module continuously
- D. System status messages and ADAS Central Module commands to output modules

7. A customer complains that their ADAS features sometimes fail to activate even when the conditions seem favorable. The scan tool shows normal communication and no stored codes. The technician's best approach to investigate is:

- A. Clearing all history codes immediately and sending the customer home for more driving
- B. Replacing the ADAS Central Module as the probable root cause for intermittent issues
- C. Reviewing enable criteria for the relevant features and confirming conditions during each attempt
- D. Performing static calibrations on every ADAS sensor on the vehicle as a precaution

8. Which of the following best distinguishes a DTC "history" status from a "current" status?

- A. Current codes are stored as permanent codes and history codes are not permanent
- B. Current codes reflect an active fault, while history codes reflect a past fault no longer active
- C. History codes always indicate severe problems while current codes indicate minor issues
- D. Current codes are read through OBD-II while history codes require OEM-specific tools

8. A vehicle arrives with fault codes on multiple modules after an aftermarket remote start system installation. The most productive investigation is:

- A. Disabling and removing the aftermarket remote start system as the likely cause of the codes
- B. The aftermarket installation's impact on shared circuits and CAN networks
- C. Replacing modules showing codes to eliminate the aftermarket interference
- D. Reprogramming every affected module with the current OEM firmware release

9. Technician A says that Gateway Module failures can prevent scan tool communication even when individual modules are working correctly. Technician B says scan tool communication is always available directly to individual modules regardless of Gateway Module state. Who is correct?

- A. Technician B only — scan tools bypass the Gateway to reach individual modules

- B. Both technicians are partially correct under different communication scenarios
- C. Neither technician is correct about vehicle network architecture
- D. Technician A is correct and Technician B is wrong about scan tool communication

10. On the composite vehicle, which of the following describes the ADAS Central Module's architectural role most accurately?

- A. A central decision-making hub that receives sensor data, runs ADAS logic, and issues output commands
- B. A low-level processor that only forwards data without making any decisions for the vehicle
- C. A backup module that operates only when the Gateway Module has failed completely
- D. A peripheral module that has no role in coordinating other ADAS functions on the vehicle

11. A customer's pre-repair scan reveals that four different modules each report a "low battery voltage" history code from the same date and time. The most likely root cause is:

- A. Each module developed an internal voltage monitoring fault on the exact same day
- B. The vehicle's OBD-II connector experienced a communication error on that date
- C. A single charging system or battery event affected all modules simultaneously on that date
- D. The customer's driving style caused stress on each module sequentially over time

12. Which of the following best describes the purpose of programming versus coding during a module replacement?

- A. Programming configures the module for the specific vehicle, and coding loads the firmware
- B. Programming loads the firmware, and coding configures the module for the specific vehicle
- C. Programming and coding are synonymous and describe the same activity exactly
- D. Both steps are optional and can be skipped if the replacement module is pre-configured

13. A vehicle experiences an ADAS fault only when the climate control is set to maximum defrost. The scan tool shows a battery voltage DTC during defrost events. The most productive investigation considers:

- A. Replacing the forward camera module as a precaution for the intermittent condition
- B. Complete reprogramming of the ADAS Central Module with the current firmware release
- C. Normal operation — all vehicles exhibit this pattern during maximum defrost settings
- D. The charging system's capacity to support maximum electrical load including defrost and ADAS

14. A technician is explaining to a customer why pre-repair scans are essential. The most accurate explanation for a customer audience is that pre-repair scans:

- A. Document the vehicle's condition before work begins so the shop can verify what issues pre-existed
- B. Clear all existing codes automatically so the vehicle starts with a fresh diagnostic condition
- C. Increase the cost of the repair significantly beyond what the customer would pay otherwise
- D. Are required by state law for every automotive repair regardless of vehicle make

15. On the composite vehicle, if multiple ADAS modules lose communication simultaneously, the most productive first investigation is:

- A. Replacing the module with the most recent model year manufacturing date
- B. Reprogramming each affected module with the current software release available
- C. Shared power feeds, shared grounds, and the Gateway Module function on the relevant networks
- D. Performing static calibrations on all sensors as the most probable fix for the issue

16. A scan tool shows all expected modules responding during a full-system scan. This observation alone confirms:

- A. Every ADAS feature on the vehicle is functioning as the customer would expect

- B. The modules have electrical power and basic network communication capability
- C. The vehicle's ADAS system has been correctly calibrated to the reference frame
- D. All service information and TSBs have been correctly applied to the vehicle's software

17. A customer complains that ADAS features behave inconsistently after a recent transmission service that involved battery disconnection. The most productive investigation considers:

- A. Replacing every ADAS sensor as a precaution against transmission-related electrical issues
- B. Complete reprogramming of the ADAS Central Module with the current firmware release
- C. Performing static calibrations on all sensors to restore alignment after transmission work
- D. Whether any affected modules require initialization or relearn procedures after battery disconnection

18. Which of the following most accurately describes what a DSO (digital storage oscilloscope) reveals about a CAN bus that a DMM (digital multimeter) cannot?

- A. Signal quality, symmetry, transitions, and waveform shape during actual bus communication
- B. The DC voltage levels of CAN-H and CAN-L at various points in the system
- C. The exact resistance between CAN-H and CAN-L with the ignition off at rest
- D. The continuity of the wiring harness between two specific points in the circuit

19. A forward camera calibration has been performed on the composite vehicle. The technician used the OEM procedure and verified all preconditions. Operational testing now reveals that lane keep assist occasionally provides steering in the wrong direction. The most accurate interpretation is:

- A. The camera has failed internally and requires replacement with a new unit
- B. The Electronic Power Steering Module has failed during or after the calibration
- C. Normal operation — lane keep assist occasionally provides incorrect steering under standard conditions
- D. A condition that was present before calibration and not caused by the procedure itself — investigate further

20. A camera-dependent feature works correctly on straight roads but fails when encountering sharp curves. The forward camera is recently calibrated. The most likely cause is:

- A. The camera requires immediate replacement with a new unit from OEM stock
- B. Complete failure of the Electronic Power Steering Module during curve navigation
- C. Feature limitations on curves — the camera's reference frame has expected limits
- D. Normal operation that the customer should not consider a fault in any way

21. Which of the following camera-related failures would most likely produce the symptom "all camera-dependent features fail simultaneously"?

- A. Contamination affecting the specific area of the windshield where TSR reads signs
- B. A complete loss of power or communication to the forward camera module itself
- C. Calibration drift affecting only the lane keep assist feature steering input
- D. A failed driver monitoring camera affecting only the cabin-facing imagery

22. A customer reports that surround view worked correctly yesterday but today shows a black area where the left side camera's image should appear. The most productive first investigation considers:

- A. Replacing the entire surround view system as a precautionary measure
- B. Performing a complete static calibration of every surround view camera
- C. Reprogramming the Surround View Module with the most current firmware
- D. Physical inspection of the left exterior mirror and camera for damage or connection issues

23. Which of the following most accurately compares lane departure warning (LDW) to lane keep assistance (LKA)?

- A. LDW alerts the driver, while LKA provides active steering input to correct drift

- B. LDW is more advanced than LKA and uses different sensor technology
- C. LDW operates only at lower speeds than LKA can function at
- D. LDW and LKA are completely independent systems that never share components

24. A technician has replaced a forward camera and completed the static calibration portion. The OEM requires a dynamic calibration to follow. The most accurate statement about this requirement is:

- A. Static calibration alone is sufficient for any OEM on any vehicle
- B. Dynamic calibration can be skipped if the customer is in a hurry
- C. Both static and dynamic calibrations are required per OEM procedure and must be completed
- D. Dynamic calibration will complete automatically during the customer's first drive

25. A forward-facing camera on the composite vehicle cannot have its lens cleaned per the reference. If the lens has been contaminated during service, the correct action is:

- A. Clean the lens with lens cleaner and a microfiber cloth following standard procedures
- B. Replace the camera assembly per the reference guidance for contaminated lenses
- C. Apply a new protective coating to the lens as a field-level repair
- D. Leave the contamination in place and hope it does not affect camera operation significantly

26. Traffic sign recognition failure at night but normal operation during the day most directly points to:

- A. Complete failure of the forward camera module requiring replacement with a new unit
- B. The Electronic Power Steering Module's lighting response requires reprogramming
- C. Calibration drift affecting TSR operation only during specific times of day
- D. Camera view, illumination, or visibility conditions affecting sign detection at night

27. Which of the following best distinguishes a driver monitoring camera from a forward-facing camera?

- A. The driver monitoring camera observes the driver; the forward camera observes the road ahead
- B. The driver monitoring camera has higher resolution than a forward-facing camera always
- C. The driver monitoring camera operates only during daylight hours unlike the forward camera
- D. The driver monitoring camera uses completely different communication networks than other ADAS cameras

28. A driver monitoring system produces false warnings when the driver is wearing a baseball cap with a low brim. The most likely cause is:

- A. Replacing the driver monitoring camera module immediately with a new unit
- B. Complete failure of the infrared illuminators requiring immediate replacement
- C. The cap brim interferes with the camera's view of the driver's eyes and face
- D. Normal operation that the customer should not consider a fault in any way

29. Which of the following camera service events most commonly requires calibration to be performed per OEM position statements?

- A. Cleaning the windshield with approved automotive glass cleaner
- B. Replacing windshield wiper blades at regular service intervals
- C. Checking tire pressures during routine maintenance service work
- D. Windshield replacement on a vehicle equipped with a forward-facing camera

30. A customer reports that automatic high beam control activates high beams too aggressively, turning them on when streetlights are visible. The most productive first investigation considers:

- A. Complete replacement of the vehicle's entire lighting system as a starting step

- B. The forward camera's sensitivity, view impairment, and calibration affecting HBA detection
- C. Normal operation — HBA is not designed to recognize streetlights in all conditions
- D. Reprogramming the Gateway Module with the current firmware release available

31. A radar module's data stream shows detected target range that oscillates between 30 meters and 200 meters for a target actually at 50 meters. The pattern suggests:

- A. Normal radar behavior that frequently exhibits variability in range detection readings
- B. The scan tool's software has failed and requires factory reset to function properly
- C. Calibration was performed correctly and the reading is an accurate target description
- D. Internal radar failure or significant interference affecting target range calculation

32. A scan tool reports that an ADAS-related U-code has set with freeze frame showing battery voltage at 11.6 volts. The most productive diagnosis considers:

- A. The charging system's ability to maintain voltage under normal ADAS operating load
- B. Replacing the module that set the U-code immediately without further investigation
- C. Normal operation since ADAS modules tolerate a wide range of voltages without issue
- D. Complete reprogramming of the ADAS Central Module with current firmware available

33. Which of the following most accurately describes the purpose of the corner radar private CAN bus on the composite vehicle?

- A. To provide cellular internet connectivity to the corner radar modules during operation
- B. To route diagnostic scan tool communication separately from the public ADAS CAN bus
- C. To carry high-volume raw corner radar data separately from general public ADAS traffic
- D. To provide a backup communication path when the public ADAS CAN fails completely

34. On the composite vehicle, the left rear corner radar module's role as primary node on the private CAN bus means that it:

- A. Is the only corner radar that receives power from the ADAS Central Module directly
- B. Aggregates data from the four corner radars and forwards results to the ADAS Central Module
- C. Controls the four corner radars directly and commands them during normal operation
- D. Has a different terminator value than the other three corner radars on the bus

35. Adaptive cruise control requires input from which primary sensor category and which additional input source?

- A. Forward camera and the driver monitoring system inputs for attention verification
- B. Ultrasonic sensors and the Telematics Control Module cellular data reception
- C. LiDAR and the Instrument Cluster Module for driver interface during operation
- D. Forward radar and the ACC switch inputs on the steering wheel for driver control

36. A non-OEM bumper cover installed in a radar zone may cause which specific type of ADAS degradation?

- A. Attenuation of the 77 GHz radar signal producing reduced detection range and performance
- B. Enhanced radar performance from the material's specific electromagnetic properties
- C. Complete radar failure requiring immediate module replacement with OEM specification
- D. No effect whatsoever on radar performance under any operating conditions

37. Which of the following best distinguishes radar calibration drift from a radar requiring replacement?

- A. Drift always produces hard DTCs while failure produces only minor warning codes
- B. Drift can never be corrected while module replacement is the only possible solution

- C. Drift can often be corrected by recalibration, while true internal failure requires replacement
- D. Drift and failure produce identical symptoms indistinguishable by any diagnostic method

38. A customer reports that AEB triggers on stationary roadside fixtures like guardrails. The forward radar was calibrated last week at a shop that claimed the calibration was successful. The most productive response is:

- A. Ignoring the complaint since the calibration was performed recently without any issue
- B. Investigating whether preconditions were met during the recent calibration — silent miscalibration is possible
- C. Replacing the forward radar module immediately as the likely root cause of the complaint
- D. Reprogramming the ADAS Central Module with current firmware to correct the issue

39. Which of the following most accurately describes the relationship between the forward radar module and the ADAS Central Module on the composite vehicle?

- A. The forward radar module controls the ADAS Central Module directly through a hardwired link
- B. The forward radar and ADAS Central Module are completely independent with no communication
- C. The forward radar module and ADAS Central Module are the same physical module combined
- D. The forward radar forwards detected target data to the ADAS Central Module over the ADAS CAN bus

40. A forward radar calibration that requires both static and dynamic procedures per OEM specification should have:

- A. Both procedures completed in the OEM-specified sequence before the vehicle is delivered
- B. Only the static procedure completed — dynamic calibration is always optional
- C. Only the dynamic procedure completed — static calibration is rarely required
- D. One procedure completed now, with the other scheduled for a future appointment

41. A radar calibration procedure aborts with a specific precondition error message. The most productive response is:

- A. Replacing the radar module with a new unit before attempting the calibration again
- B. Ignoring the error message and repeating the calibration with identical settings
- C. Reviewing each specific precondition flagged by the scan tool and addressing them before retrying
- D. Performing a dynamic calibration instead and skipping the static portion entirely

42. A forward radar module's static calibration requires the shop floor slope to be within a specific tolerance. OEM specifications typically limit floor slope to:

- A. 5 degrees total maximum across the entire calibration area for the vehicle
- B. 1 degree total maximum across the calibration area per typical OEM specification
- C. 10 degrees total maximum across the calibration area for most modern vehicles
- D. No maximum slope specification — any floor condition is acceptable for calibration

43. A customer's ACC started behaving erratically after a front-end collision repair at another shop. The repair included bumper cover replacement with OEM parts. The most productive investigation considers:

- A. Normal ACC behavior that always occurs after any front-end collision repair is completed
- B. The Electronic Brake Control Module requires immediate replacement with a new unit
- C. Radar calibration status and whether the bumper cover work was properly followed up
- D. Complete reprogramming of the ADAS Central Module with the current firmware release

44. On the composite vehicle, blind spot warning and rear cross-traffic alert depend on which sensor category?

- A. Rear corner radar modules and their private CAN bus communication with the ADAS Central Module

- B. Forward camera and its imaging of lane markings for blind spot and cross-traffic detection
- C. Ultrasonic sensors mounted in the rear bumper for short-range detection
- D. Forward radar module for long-range forward-facing detection at highway speeds

45. A radar module has been replaced and programmed successfully. The scan tool shows a "calibration required" code. The next required action is:

- A. Clearing the code and delivering the vehicle to the customer for normal use
- B. Replacing the radar module a second time with another new unit from inventory
- C. Performing the OEM-specified calibration procedure per current service information
- D. Reprogramming the ADAS Central Module with the most current firmware release

46. A customer reports that one specific ultrasonic sensor consistently reports a closer distance than reality, while other sensors report accurately. The most likely cause is:

- A. Complete failure of the Ultrasonic Control Module requiring replacement with a new unit
- B. The specific sensor is mounted at an incorrect angle or position in the bumper
- C. Normal operation that all ultrasonic sensors frequently exhibit after installation
- D. Complete failure of every ultrasonic sensor requiring replacement with new units

47. A customer's parking assist chimes continuously in an open parking lot with no obstacles. The ultrasonic sensors appear clean upon inspection. The most productive investigation considers:

- A. Replacing every ultrasonic sensor as a precaution against internal contamination
- B. Complete reprogramming of the Ultrasonic Control Module with current software
- C. Scan tool data review of individual sensor distance values to identify reporting issues
- D. Performing a dynamic calibration drive cycle to reset all ultrasonic parameters completely

48. Which of the following best distinguishes an ultrasonic sensor fault from a Ultrasonic Control Module fault?

- A. Single sensor fault shows one sensor reporting abnormally; module fault affects multiple sensors together
- B. Single sensor fault requires control module replacement; module fault requires sensor replacement
- C. Both faults produce identical symptoms impossible to distinguish through any diagnostic method
- D. Single sensor faults are always intermittent; module faults are always continuous in nature

49. On the composite vehicle, the Ultrasonic Control Module sends aggregated detection data to which destination?

- A. A dedicated private CAN bus exclusively shared with the Surround View Module
- B. The ADAS Central Module over the public ADAS CAN bus communication pathway
- C. The Gateway Module only for diagnostic tool access and no further transmission
- D. The Electronic Power Steering Module for low-speed steering decisions during parking

50. Which of the following is most likely to cause an ultrasonic sensor to report false echoes during rainy weather only?

- A. Water droplets on the sensor transducer face producing false echo returns
- B. Complete failure of every ultrasonic sensor simultaneously during rain events
- C. The Ultrasonic Control Module requires reprogramming for rain operation mode
- D. Normal operation — ultrasonic sensors always fail during any precipitation events

PRACTICE EXAM 9: ANSWER KEY AND EXPLANATIONS

1. A — An oscilloscope waveform of the CAN bus reveals signal quality, symmetry, and bidirectional communication health that continuity testing or visual inspection cannot show. Pathway faults produce specific waveform anomalies (amplitude mismatches, ringing, missing transitions) that distinguish them from internal module failures, which typically show clean signal on the bus but no response from the module.
2. C — The composite vehicle's ADAS Central Module issues torque requests to the Electronic Power Steering Module over the public ADAS CAN bus, and the EPS module then translates those requests into commanded current to the steering motor. This request-and-execute architecture is a critical distinction — the ADAS Central Module does not drive actuators directly, and understanding this pathway is essential for correct diagnosis.
3. B — Alternator output of 14.2 volts during engine operation is normal charging voltage that supports typical ADAS module operating requirements. This reading indicates the charging system is functioning correctly and is not the source of any ADAS issue. Over-charging typically exceeds 15 volts, and insufficient voltage for ADAS operation would be below 12 volts.
4. D — U-code history codes across all CAN networks reflect a past event that affected multiple modules simultaneously. Investigating when the event occurred (date and time from freeze frame data) and why it happened (often a battery-related or electrical event) is the productive diagnosis, rather than assuming current module failures or ignoring the codes as irrelevant.
5. A — Comparing pre-repair and post-repair scans allows the technician to verify which codes the repair successfully resolved and identify any new codes introduced during service. This comparison is the foundation of repair quality verification and documentation, and it's why both scans are required for complete professional service rather than just one or the other.
6. D — The composite vehicle's public ADAS CAN bus most frequently carries system status messages and ADAS Central Module commands to output modules. Raw video streams travel through dedicated pathways (Ethernet or point-to-point), raw radar data stays on the private corner radar bus, and telematics configuration uses separate network paths. The public ADAS CAN's purpose is coordination messaging.
7. C — Inconsistent ADAS feature activation with no stored codes typically points to enable criteria that are not being met during the customer's actual use. Reviewing the enable criteria for the relevant features and confirming conditions during each attempt is the most productive

investigation — this identifies whether the feature is working correctly but being suppressed by its own activation logic.

8. B — A current DTC reflects a fault that is currently active in the vehicle, while a history code reflects a fault that occurred in the past but is no longer active. Both codes are stored but represent different diagnostic states — current codes require immediate attention, while history codes may indicate intermittent issues that warrant investigation of the underlying cause.
9. D — Technician A is correct: Gateway Module failures can prevent scan tool communication with modules that are themselves functional, because the scan tool reaches internal modules through the Gateway. Technician B is wrong because scan tools route through the Gateway Module to reach most internal modules; direct communication to individual modules is not how the OBD-II architecture works.
10. A — The composite vehicle's ADAS Central Module is a central decision-making hub that receives sensor inputs, runs ADAS algorithms, and issues commands to output modules. It is not a low-level data forwarder, a backup module, or a peripheral component — it is the coordination point for the ADAS subsystem and a key architectural component to understand for diagnostic reasoning.
11. C — Four different modules showing "low battery voltage" history codes from the exact same date and time indicate a single battery or charging system event affected all modules simultaneously. Coordinated timestamps across unrelated modules point to a common electrical condition rather than coincidental individual module faults developing on the same day independently.
12. B — Programming refers to loading firmware (the module's software) into the module, while coding refers to configuring the module with vehicle-specific parameters and options. These are distinct steps — programming makes the module function at all, while coding tells the already-running module about the specific vehicle it is installed in. Both are typically required after module replacement.
13. D — An ADAS fault occurring during maximum defrost with freeze frame showing low battery voltage indicates the charging system cannot support maximum electrical load plus ADAS operation. The defrost and ADAS are competing for available electrical capacity, and inadequate charging capacity or a declining battery is the root cause. Investigation of charging system adequacy is the productive step.
14. A — A customer-facing explanation of pre-repair scans should emphasize that they document the vehicle's condition before work begins, protecting the shop from responsibility for pre-existing issues. This is accurate, easy to understand, and addresses the customer's legitimate question about why the scan is being performed. Technical or legal-focused explanations miss the core purpose of the documentation.

15. C — Simultaneous loss of communication on multiple ADAS modules points to shared upstream components — shared fuses, shared grounds, or the Gateway Module's function. These shared components are statistically the most likely cause of multi-module failures, and investigating them first is far more productive than replacing individual modules or running speculative procedures like calibrations.
16. B — A full-system scan showing all expected modules responding confirms only that the modules have electrical power and basic network communication capability. It does not confirm that features are calibrated, that service information has been applied, or that the vehicle is ready for delivery. This is a starting point for diagnosis, not a verification of complete system health.
17. D — Battery disconnection during service can cause modules to lose learned data and require initialization or relearn procedures before they function correctly. Investigating whether affected modules have such requirements per OEM service information is the productive first step, rather than speculatively replacing sensors, reprogramming the ADAS Central Module, or performing unnecessary calibrations.
18. A — A digital storage oscilloscope reveals CAN bus signal quality, symmetry, transitions, and waveform shape during actual bus communication. These characteristics are invisible to a digital multimeter, which only shows static voltage or resistance readings. The DSO's ability to observe actual signal behavior is what makes it diagnostically indispensable for network troubleshooting.
19. D — A forward camera calibration performed with verified preconditions per OEM procedure should produce correct operation. Erratic lane keep assist suggesting incorrect steering direction points to something present before the calibration was performed — an alignment issue, a steering angle sensor condition, or another factor not resolved by camera calibration alone. Further investigation is required.
20. C — Lane keep assistance has known limitations on sharp curves where the camera's reference frame and steering authority are tested beyond designed parameters. This is not a failure of the camera or module but a feature limitation the customer should understand. Replacing modules or attempting further calibration will not address this inherent system constraint.
21. B — Complete loss of power or communication to the forward camera module causes all camera-dependent features to fail simultaneously — because those features share the camera as their common input. A windshield contamination pattern, calibration drift affecting only one feature, or driver monitoring issues would produce partial failure patterns, not the complete simultaneous failure described.
22. D — A black area in a surround view composite where a specific camera's image should appear typically indicates a physical issue with that camera — damage, disconnection, contamination, or bracket problem. Physical inspection is the fast, productive first step. System-wide replacement, calibration, or reprogramming are inappropriate starting points for a localized failure like this.

23. A — LDW alerts the driver to lane drift through audible and visual indicators, while LKA provides active steering input through the EPS module to correct drift. This distinction is fundamental — LDW is warn-only, LKA is actively intervening. They may share the forward camera but use entirely different output pathways, which is why one can fail while the other continues to work.
24. C — Both static and dynamic calibrations are required per OEM procedure when specified, and both must be completed before the vehicle is delivered. Static calibration establishes initial alignment using controlled targets, and dynamic calibration refines it through real-world references. Skipping either step leaves the calibration incomplete regardless of what the scan tool reports.
25. B — The composite vehicle's forward-facing camera lens cannot be cleaned per the reference document; contamination requires camera replacement. Cleaning attempts damage the optical coating and create worse problems than the original contamination. This is a reference-sourced detail that appears frequently in exam questions and in real-world service scenarios.
26. D — TSR failure at night with normal daytime operation points to visibility factors affecting sign detection in low-light conditions. Camera view impairment, insufficient illumination of signs, or windshield contamination that scatters limited light are the productive lines of investigation. Complete camera replacement or unrelated module reprogramming are not appropriate for this specific pattern.
27. A — Driver monitoring cameras observe the driver (typically the face and eyes) through infrared imaging, while forward-facing cameras observe the road ahead through visible and infrared light. This is a fundamental difference in purpose and field of view. Resolution, operating hours, and communication networks are not the defining distinction between these two camera types.
28. C — A baseball cap's low brim can block the driver monitoring camera's view of the driver's eyes and face, which the system interprets as driver drowsiness or distraction. This is a common aftermath of specific eyewear or headwear that interferes with the camera's observation area. Removing or adjusting the interfering accessory resolves the false warnings without any electronic intervention.
29. D — Windshield replacement on an ADAS-equipped vehicle with a forward-facing camera triggers the calibration requirement per virtually every major OEM's position statement. The camera bracket is bonded to the windshield, so glass service disturbs the camera's mounting position. Wiper blade replacement, tire pressure checks, and glass cleaning do not trigger calibration requirements.
30. B — HBA activating too aggressively (missing streetlights or other light sources) points to the forward camera's sensitivity, view impairment, or calibration issues affecting HBA detection. Investigation of these factors is productive — not lighting system replacement, not assuming normal behavior, not reprogramming the Gateway Module.

31. D — Target range oscillating wildly between 30 and 200 meters for a target at a known 50 meters indicates internal radar failure or significant interference. The inconsistency pattern (not a constant wrong value) rules out simple calibration error and points to module-level issues. Normal radar behavior does not include this type of oscillation; the radar is genuinely malfunctioning.
32. A — An ADAS U-code with freeze frame showing battery voltage at 11.6 volts during the fault event points directly to a charging system condition. The charging system's ability to maintain voltage under ADAS operating load must be investigated. This is not a module fault, not a scan tool error, and not a normal condition — the voltage drop is the root cause.
33. C — The composite vehicle's private corner radar CAN bus carries high-volume raw radar sensor data between the four corner radars and the ADAS Central Module, keeping this traffic separate from the public ADAS CAN. This architectural choice prevents the raw data from flooding the public network, which would interfere with general ADAS communication.
34. B — The left rear corner radar module's role as primary node on the composite vehicle's private CAN bus means it aggregates data from the four corner radars and forwards the fused result to the ADAS Central Module over the public ADAS CAN bus. This aggregation pattern is a key architectural feature and is commonly tested in exam questions.
35. D — Adaptive cruise control's core function requires input from the forward radar (for target range and closing-rate data) and the ACC switch inputs on the steering wheel (for driver control of engagement and speed). Cameras typically support enhanced features but are not required for the basic ACC function to operate on the road.
36. A — Non-OEM bumper covers in radar zones may attenuate the 77 GHz radar signal, producing reduced detection range and degraded ADAS performance. This is a well-documented issue because OEM covers are specifically designed to be radar-transparent at this frequency, while aftermarket materials may not meet this specification. The radar itself is unaffected — the cover interferes with its operation.
37. C — Radar calibration drift can often be corrected through recalibration on a verified level surface with all preconditions met, while true internal failure requires module replacement. Distinguishing these two causes requires systematic investigation — drift is more common than hardware failure, and recalibration is the correct first response for gradual detection issues.
38. B — A recent calibration that claimed success but produced real-world complaints of AEB triggering on guardrails is the classic signature of silent miscalibration. Investigating whether preconditions were actually met during the recent calibration — floor slope, vehicle loading, tire pressures, target placement — is the productive step. Module replacement without this investigation addresses a symptom, not the root cause.
39. D — The composite vehicle's forward radar module communicates detected target data to the ADAS Central Module over the ADAS CAN bus. The ADAS Central Module then processes this

data along with other sensor inputs and issues appropriate commands to output modules. The modules are separate with defined roles in the architecture.

40. A — When OEM procedures specify both static and dynamic calibration, both must be completed in the specified sequence before vehicle delivery. The procedures complement each other — static establishes initial alignment, dynamic refines it. Skipping either step or scheduling one for later leaves the calibration incomplete, even if the scan tool reports partial success.
41. C — A specific precondition error message from the scan tool tells the technician exactly what needs to be addressed before retrying the calibration. Reviewing each flagged precondition and correcting it is the professional response — ignoring the error, replacing the module, or switching to dynamic calibration all fail to address the actual cause of the abort.
42. B — OEM specifications typically limit shop floor slope to 1 degree total across the calibration area for radar static calibration. This specification accounts for the geometric precision required for accurate calibration, and exceeding this limit produces silent miscalibration. 5 degrees, 10 degrees, or "no specification" are all incorrect — the 1-degree limit is the industry standard for ADAS calibration.
43. C — Erratic ACC after a front-end collision repair with OEM parts installed raises two questions: was the radar correctly calibrated after the bumper cover work, and were preconditions verified? Bumper cover work typically requires subsequent radar calibration, and silent miscalibration from unmet preconditions can explain ACC degradation. Investigation of the calibration history and preconditions is the productive step.
44. A — On the composite vehicle, blind spot warning and rear cross-traffic alert both depend on the rear corner radar modules and their communication through the private corner radar CAN bus to the ADAS Central Module. Forward camera, ultrasonic sensors, and forward radar all handle other ADAS functions but not these rearward blind-spot and cross-traffic features.
45. C — A "calibration required" code on a newly-replaced and programmed radar module is the expected state before calibration has been performed. Performing the OEM-specified calibration procedure per current service information is the required next step, not clearing the code, replacing the module again, or reprogramming unrelated modules.
46. B — An ultrasonic sensor that consistently reports closer distance than reality is most likely mounted at an incorrect angle or position — either from installation error or from bumper cover service. The transducer face's orientation affects the measured distance directly, and incorrect mounting produces systematic readings that differ from actual physical distance.
47. C — Continuous parking assist chimes with clean sensors visible at inspection warrant scan tool data review of individual sensor distance values. This review identifies which specific sensor is reporting abnormal values and focuses the subsequent investigation. Replacement,

reprogramming, or unnecessary calibration procedures are all premature without this targeted diagnostic step.

48. A — A single ultrasonic sensor fault affects only that one sensor while the others report normally, while a control module fault typically affects multiple sensors simultaneously or disables the entire ultrasonic system. This distinction guides diagnosis — isolated sensor symptoms point to that specific sensor, widespread symptoms point to shared components like the control module or its supply.
49. B — The composite vehicle's Ultrasonic Control Module sends aggregated detection data to the ADAS Central Module over the public ADAS CAN bus. This is the standard communication pathway and differs from dedicated private buses, gateway-only routing, or direct connections to output modules. The ADAS Central Module coordinates parking-related responses based on this input along with other sensor data.
50. A — Water droplets on ultrasonic sensor transducer faces produce false echo returns that trigger false activation during rainy weather. The sensors work correctly in dry conditions because the transducer face is clear and pulses transmit normally. This weather-correlated pattern is a well-documented environmental interaction, not hardware failure or the result of precipitation defeating all ultrasonic systems universally.