PRACTICE EXAM 36

1. A technician must identify which sensing technology uses transmitted radio waves to measure the distance and closing speed of objects ahead. The correct technology is:

A. Radar, which transmits radio waves and measures their reflected return

B. Ultrasonic, which emits high-frequency sound and times the echo return

C. A forward camera, which captures visible-light images of the road scene

D. GPS, which receives timing signals from orbiting navigation satellites

2. A vehicle's ADAS receives a signal describing how far the steering wheel has been turned from center. This signal is provided by the:

A. Yaw rate sensor, which measures rotation about the vehicle's vertical axis

B. Wheel speed sensors, which measure each wheel's rotational velocity rate

C. Steering angle sensor, which reports the wheel's position relative to center

D. Brake pedal position sensor, which measures how far the pedal is pressed

3. A technician identifies a component that emits high-frequency sound waves to detect nearby objects at low speed during parking. This component is the:

A. Forward radar sensor mounted behind the front bumper cover assembly

B. Ultrasonic sensor mounted in the front and rear bumper cover faces

C. Multifunction camera mounted at the top center of the windshield glass

D. LiDAR unit that scans the scene with pulsed laser light beams ahead

4. A technician must identify the module that routes messages between different vehicle data bus networks. This module is commonly called the:

A. Gateway module, which passes messages between separate bus networks

B. Forward radar module, which processes only the radar sensor's own data

C. Driver monitoring module, which watches the driver's face and eye state

D. Electronic brake control module, which manages the wheel brake pressures

5. A vehicle uses pulsed laser light to build a detailed three-dimensional map of its surroundings. The technician should identify this sensing technology as:

A. Radar, which transmits radio waves and measures their reflected return

B. Ultrasonic, which emits sound waves and times the returning echo signal

C. LiDAR, which emits pulsed laser light to measure distances in three dimensions

D. GPS, which receives satellite timing signals to determine vehicle position

6. A technician must identify the input that tells ADAS the vehicle's rotation about its vertical axis during a turn. This input comes from the:

A. Steering angle sensor, which reports the steering wheel's turned position

B. Wheel speed sensors, which report each wheel's individual rotational rate

C. Yaw rate sensor, which measures the vehicle's rotation about its vertical axis

D. Brake pedal sensor, which measures how far the brake pedal is depressed

7. A technician identifies a system that warns the driver when a vehicle is detected in the area beside and behind the vehicle. This system is the:

A. Blind-spot monitoring system, using rear corner radar to detect side traffic

B. Adaptive cruise control system, using forward radar to maintain a gap ahead

C. Lane-departure warning system, using a forward camera to read lane lines

D. Park-assist system, using ultrasonic sensors to detect close-range objects

8. A technician must identify which sensor type is most affected by heavy fog and airborne moisture due to light scattering. The correct answer is:

A. Radar, which transmits radio waves largely unaffected by airborne moisture

B. Ultrasonic, which uses sound waves to detect very close-range objects only

C. LiDAR, which uses laser light that scatters in fog and dense moisture

D. The wheel speed sensor, which reads a toothed ring at each road wheel

9. A vehicle's adaptive cruise control automatically maintains a set following distance behind the vehicle ahead. The primary sensor enabling this function is the:

A. Rear corner ultrasonic sensor mounted in the rear bumper cover face

B. Forward-facing radar sensor that measures distance and closing speed ahead

C. Driver monitoring camera that tracks the driver's head and eye position

D. Steering angle sensor that reports the steering wheel's position from center

10. A technician must identify the component that projects driver information onto the windshield within the driver's forward view. This component is the:

A. Multifunction forward camera mounted at the top center of the windshield

B. Forward radar sensor mounted behind the lower front bumper cover area

C. Ultrasonic park sensor mounted in the face of the rear bumper cover

D. Head-up display unit that projects an image onto the windshield glass

11. A technician identifies a system that automatically applies the brakes when a frontal collision is imminent and the driver does not react. This system is:

A. Lane-keeping assist, which steers the vehicle back toward the lane center

B. Blind-spot monitoring, which warns of vehicles beside and behind the vehicle

C. Adaptive cruise control, which maintains a set gap to the vehicle ahead

D. Automatic emergency braking, which brakes to prevent an imminent collision

12. A technician must identify which input ADAS uses to know the vehicle's road speed. This input most commonly originates from the:

A. Wheel speed sensors processed and broadcast by the brake control module

B. Cabin air temperature sensor mounted near the climate control head unit

C. Fuel level sender float positioned inside the vehicle's fuel tank assembly

D. Outside ambient light sensor located on the top surface of the dashboard

13. A technician identifies a feature that uses GPS along with map data to anticipate curves and speed limits ahead. The technician should recognize GPS provides:

A. The vehicle's geographic position from received satellite timing signals

B. The exact distance to the vehicle directly ahead in the same travel lane

C. The high-frequency sound pulses used to detect close-range parking objects

D. The steering wheel's angular position relative to the straight-ahead center

14. A technician must identify the component that reads the painted lane lines on the road surface ahead. This component is the:

A. Rear corner radar sensor mounted inside the rear bumper cover assembly

B. Ultrasonic sensor mounted in the front bumper cover for parking detection

C. Forward-facing camera mounted at the top of the windshield reading lanes

D. Yaw rate sensor measuring the vehicle's rotation about its vertical axis

15. A technician identifies a system that monitors the driver's attentiveness using an interior-facing camera. This system is the:

A. Blind-spot monitoring system using rear corner radar for side detection

B. Adaptive cruise control system using forward radar to maintain a set gap

C. Park-assist system using ultrasonic sensors for close-range object detection

D. Driver monitoring system using an interior camera to track driver attention

16. A technician must distinguish between static and dynamic calibration. A static calibration is defined as one that:

A. Uses fixed targets with the vehicle stationary in a controlled bay setting

B. Requires driving the vehicle on the road under specified traffic conditions

C. Is performed only with a tape measure and never with any scan tool involved

D. Can be completed in any lighting condition regardless of the bay environment

17. A technician identifies the network most ADAS modules use to share high-speed data with one another. This network is commonly the:

A. CAN bus, a high-speed differential network linking the control modules

B. The 12-volt battery feed that supplies operating power to each module

C. The vehicle's ground distribution system bonded to the body and frame

D. The windshield's embedded antenna grid used for radio signal reception

18. A technician must identify which sensing technology best detects objects at very close range during low-speed parking maneuvers. The correct technology is:

A. Forward radar, which measures distance and closing speed at longer ranges

B. The forward camera, which reads lane markings and traffic signs ahead

C. LiDAR, which builds a three-dimensional map using pulsed laser light beams

D. Ultrasonic sensors, which detect close objects using high-frequency sound

19. A technician must identify the part of a camera-based system that physically holds the camera in its aimed position on the glass. This part is the:

A. Optical lens element that focuses incoming light onto the image sensor

B. Mounting bracket that secures the camera in its aimed position on the glass

C. Image processor that converts the captured light into digital lane data

D. Data bus connector that links the camera to the gateway control module

20. A forward camera relies on adequate contrast between the lane markings and the road surface. The technician should recognize that worn or faded markings will:

A. Improve the camera's ability to detect the lane by reducing visual glare

B. Reduce the contrast the camera needs, impairing reliable lane detection

C. Have no effect because the camera reads only the road's edge boundaries

D. Increase the camera's maximum forward detection range beyond its limit

21. A camera system's diagnostic procedure requires the technician to first determine whether the available service information is adequate. If it is not, the technician should:

A. Replace the camera module to eliminate it as a cause without information

B. Guess at the diagnosis based on experience with other vehicle brands instead

C. Clear the codes and release the vehicle since information is unavailable now

D. Seek additional manufacturer resources before proceeding with the diagnosis

22. A technician must identify why a forward camera requires calibration after windshield replacement. The reason is that the new glass can:

A. Change the camera's data bus speed and disrupt module communication

B. Increase the supply voltage delivered to the camera's internal image sensor

C. Reduce the rear ultrasonic sensors' maximum object-detection distance

D. Alter the camera's mounting position and aim relative to the road ahead

23. A camera reports a fault indicating its view is obstructed. The technician should first inspect the:

A. Rear bumper ultrasonic sensors for dirt, ice, or paint overspray buildup

B. Windshield area and lens directly in front of the camera for obstruction

C. Forward radar sensor bracket for proper mounting torque to specification

D. Data bus termination resistance measured at the gateway module connector

24. A technician must identify the term for aligning a camera's reference to the vehicle so it reads the road correctly. This process is called:

A. Programming, which loads operating software into the camera's memory

B. Configuration, which tells the module which vehicle options are installed

C. Calibration, which aligns the camera's reference so it reads the road correctly

D. Initialization, which clears the module's stored adaptive learned values

25. A camera-based lane-keeping system steers the vehicle back toward center when it drifts. The technician should identify the sensor providing the lane-position data as the:

A. Rear corner radar sensor mounted inside the rear bumper cover assembly

B. Forward-facing camera that reads the painted lane markings on the road

C. Ultrasonic sensor mounted in the front bumper for close-range detection

D. Yaw rate sensor measuring the vehicle's rotation about its vertical axis

26. A technician must identify the most likely effect of a smudged or filmed camera lens on system performance. The film will:

A. Extend the camera's effective detection range beyond its rated distance

B. Improve image clarity by reducing glare from oncoming vehicle headlights

C. Recalibrate the camera automatically the next time the vehicle is driven

D. Distort or obscure the captured image, degrading detection and calibration

27. A technician must determine whether a camera concern is normal operation or a malfunction. The correct first step is to:

A. Replace the camera module to rule it out as a possible cause quickly

B. Verify the concern and research the system's normal operating behavior

C. Recalibrate the camera before doing any other diagnostic verification step

D. Clear all stored codes and release the vehicle to observe for symptoms

28. A technician identifies that a camera's mounting bracket is bonded to the windshield rather than to the vehicle body. The significance is that windshield replacement:

A. Requires correct glass with the bracket and a calibration afterward

B. Has no effect on the camera since the bracket stays with the old glass

C. Allows the camera to be mounted lower on the new glass for better view

D. Eliminates the need for any calibration because the bracket is reused

29. A camera calibration target must match a specified pattern and contrast. The technician should recognize that using an incorrect target will:

A. Increase the rear ultrasonic sensor's maximum detection distance value

B. Cause a short circuit between the camera supply and ground in the module

C. Improve calibration accuracy by giving the camera a sharper reference image

D. Cause the camera to fail to recognize the target, aborting the calibration

30. A technician completes a camera repair and must confirm no faults remain. The required step is to:

A. Reset the engine oil life monitor to one hundred percent remaining life

B. Record the customer's preferred cabin climate settings for the next visit

C. Top off the windshield washer reservoir with the approved winter solution

D. Perform a post-repair scan confirming no related DTCs remain stored

31. A technician must identify the operating principle of an automotive radar sensor. A radar sensor works by:

A. Emitting high-frequency sound waves and timing the returning echo signal

B. Transmitting radio waves and measuring the reflected return from objects

C. Capturing visible-light images and processing them for lane detection data

D. Receiving satellite timing signals to calculate the vehicle's road position

32. (Refer to ADAS Composite Vehicle Type 1.) A scan tool cannot communicate with only the forward radar module, while all other modules respond normally. The technician should focus the diagnosis on the:

A. Circuit or connector serving the forward radar module specifically here

B. Shared battery feed common to every ADAS module on the vehicle at once

C. Gateway module, which would disable all bus communication simultaneously

D. Driver monitoring camera, which uses a completely separate private data line

33. A technician must identify why a radar sensor's exact mounting angle is critical. A small angular mounting error is significant because it:

A. Changes the data bus baud rate the radar uses to transmit its messages

B. Creates a large lateral position error at the radar's far detection range

C. Increases the supply voltage the radar draws from the vehicle battery system

D. Lowers the resistance of the radar sensor's internal heating element circuit

34. A technician identifies that excessive paint or filler over a radar sensor degrades its performance. The mechanism is that the excess material:

A. Raises the sensor's supply voltage above its rated operating maximum value

B. Changes the vehicle's CAN bus baud rate during message transmission timing

C. Attenuates and delays the radar signal passing through the cover material

D. Forces the ultrasonic sensors to share the radar's data bus bandwidth fully

35. A technician must identify the system that uses rear corner radar to warn of vehicles approaching from the side and rear. This system is the:

A. Blind-spot monitoring system, which detects vehicles beside and behind the car

B. Forward-collision warning system, which detects vehicles directly ahead only

C. Park-assist system, which detects close objects using ultrasonic sound waves

D. Lane-keeping assist system, which reads painted lane lines with a camera

36. (Refer to ADAS Composite Vehicle Type 1.) With the ADAS central module unplugged, a DMM across the ADAS-CAN pair reads about 120 Ω. The technician should interpret this reading as indicating the:

A. Bus has a dead short between its two conductors in the harness wiring

B. Bus has a complete open isolating one module from the rest of the network

C. Bus termination is intact and the measured circuit is configured normally

D. Battery is fully discharged and cannot supply the measurement current flow

37. A technician must identify the reference the vehicle actually tracks along, used for radar aim during calibration. This reference is the vehicle's:

A. Front bumper distance measured to the calibration target stand base point

B. Thrust line, established by the rear axle geometry the vehicle tracks along

C. Steering wheel position held perfectly straight throughout the procedure

D. Forward camera optical axis projected down onto the calibration bay floor

38. A technician must identify whether radar calibration can be static, dynamic, or both. The correct understanding is that radar calibration:

A. May be static, dynamic, or both, depending on the manufacturer's procedure

B. Is always strictly dynamic and can never be performed in a stationary bay

C. Is always strictly static and can never involve any road driving at all

D. Never requires calibration because radar sensors self-align automatically

39. A technician identifies green corrosion on a radar connector's terminals. The correct corrective action is to:

A. Apply additional body filler around the connector to seal out future moisture

B. Repair or replace the affected terminals and connector to restore the circuit

C. Increase the system supply voltage to overcome the added contact resistance

D. Clear the stored codes and release the vehicle, since corrosion is cosmetic only

40. (Refer to ADAS Composite Vehicle Type 1.) A technician needs the forward radar's maximum detection range. The correct source for this specification is the:

A. Estimating software's labor guide entry for the front bumper assembly job

B. Aftermarket catalog listing for the radar sensor's replacement part number

C. Composite vehicle reference, which lists the radar's range specification value

D. Shop foreman's experience with similar radar systems on other vehicle brands

41. A radar calibration aborts indoors despite a correct target setup. The technician suspects environmental interference. Which finding best supports that?

A. A 1.5 volt drop measured across the radar sensor's main ground connection

B. A target printed in a gray shade slightly off the manufacturer's specification

C. A metal parts cart and a vehicle lift positioned within the radar's field

D. A camera software version one revision behind the radar module's software

42. A technician must identify the likely cause of a radar dropout that occurs only over rough pavement. This vibration-linked symptom points to:

A. An outdated calibration file that needs a reflash at the next service visit

B. A loose connector or mount that breaks electrical contact under vibration

C. A permanently failed radar sensor requiring immediate full replacement now

D. Normal operation, since radar is designed to mute over any rough pavement

43. A radar is replaced and calibration completes, but a road test shows the ACC reacting to vehicles in adjacent lanes. The technician should suspect a:

A. New radar shipped from the wrong regional distribution center originally

B. Battery voltage that was marginal during the static calibration phase earlier

C. Set of ultrasonic sensors left disconnected during the road test drive run

D. Residual aim or mounting error skewing the radar's lateral detection field

44. A technician must identify why a static radar calibration requires a reflection-free bay. Stray reflections matter because they can:

A. Lower the 12-volt supply voltage reaching the radar during the procedure

B. Increase the resistance of the radar sensor's internal heating element circuit

C. Return false signals that corrupt the radar's calibration reference data

D. Erase the stored DTCs from the gateway module before calibration begins

45. After a radar repair, a manufacturer-specified road test confirms the ACC holds proper following distance. The road test primarily verifies that the:

A. System performs correctly under actual real-world driving conditions on road

B. Battery fully recharged after the static calibration procedure was completed

C. Tire pressure monitor relearned all four sensors during the test drive period

D. Engine reached full operating temperature before the stored codes were cleared

46. A technician must identify the operating principle of an ultrasonic parking sensor. An ultrasonic sensor works by:

A. Transmitting radio waves and measuring the reflected return from nearby objects

B. Capturing visible-light images and processing them for object detection ahead

C. Receiving satellite timing signals to calculate the vehicle's parking position

D. Emitting high-frequency sound waves and timing the returning echo from objects

47. A technician must identify the system that uses ultrasonic sensors to detect objects during low-speed parking. This system is the:

A. Adaptive cruise control system, using forward radar to maintain a set gap

B. Lane-keeping assist system, using a forward camera to read lane markings

C. Park-assist system, using ultrasonic sensors to detect close-range objects

D. Blind-spot monitoring system, using rear corner radar to detect side traffic

48. (Refer to ADAS Composite Vehicle Type 1.) A technician needs the detection range and pattern of the rear ultrasonic sensors. The authoritative source is the:

A. Resistance measured directly across each sensor's two connector terminals

B. Forward radar's published range specification scaled down for the rear sensors

C. Vehicle wheelbase printed on the certification label inside the door jamb area

D. Composite vehicle reference document describing the ultrasonic system specs

49. A technician must identify the effect of thick paint over an ultrasonic sensor face. The paint will:

A. Dampen the emitted and returning sound waves, reducing detection reliability

B. Increase the measured echo time, making objects appear much farther away

C. Improve detection by focusing the sound into a tighter, more narrow beam

D. Have no measurable effect because the sound waves pass through paint freely

50. A single ultrasonic sensor reads erratically while the others function normally. The most efficient first inspection step is to check that sensor's:

A. Software revision against the park-assist controller's current version number

B. Face and connector for obstruction, physical damage, or a loose connection

C. Contribution to the data bus termination resistance measured at the gateway

D. Supply voltage compared against the forward radar sensor's supply voltage

Answer Key & Full Answer Explanations

1. A — Radar transmits radio waves and measures their reflected return, making it the technology that reads distance and closing speed ahead. The reflected signal's timing and frequency shift yield range and speed. Ultrasonic uses sound, the camera uses light, and GPS uses satellite signals.

2. C — The steering angle sensor reports the wheel's position relative to center, providing how far the wheel is turned. ADAS uses this for path prediction. The yaw rate sensor measures vehicle rotation, wheel-speed sensors measure rotational velocity, and the brake sensor measures pedal travel.

3. B — Ultrasonic sensors mounted in the bumper cover faces emit high-frequency sound to detect nearby objects at low parking speeds. They are the short-range parking technology. Radar, the camera, and LiDAR serve different ranges and principles.

4. A — The gateway module passes messages between separate bus networks, routing data among them. It is the central translator between buses. The radar, driver-monitoring, and brake-control modules handle their own specific functions, not inter-network routing.

5. C — LiDAR emits pulsed laser light to measure distances in three dimensions, building a detailed map of the surroundings. The laser pulses' return times create a 3D point cloud. Radar uses radio waves, ultrasonic uses sound, and GPS uses satellite signals.

6. C — The yaw rate sensor measures the vehicle's rotation about its vertical axis during a turn. This describes how the vehicle is rotating, not where the wheel points. The steering angle, wheel-speed, and brake sensors measure different quantities.

7. A — The blind-spot monitoring system uses rear corner radar to detect side traffic beside and behind the vehicle. That is its defining function and sensor. ACC uses forward radar, lane-departure uses a camera, and park-assist uses ultrasonic sensors.

8. C — LiDAR uses laser light that scatters in fog and dense moisture, making it the most affected by those conditions. Airborne droplets disrupt the laser returns. Radar penetrates moisture well, ultrasonic is short-range, and wheel-speed sensors are unaffected by fog.

9. B — The forward-facing radar sensor measures distance and closing speed ahead, enabling adaptive cruise to hold a set gap. Radar's range and rate data drive the following-distance control. Ultrasonic, the driver camera, and the steering sensor do not provide forward range.

10. D — The head-up display unit projects an image onto the windshield glass within the driver's forward view. That is its purpose. The camera, radar, and ultrasonic sensors sense the environment; they do not project information.

11. D — Automatic emergency braking brakes to prevent an imminent collision when the driver does not react. That is its defining action. Lane-keeping steers, blind-spot monitoring warns of side traffic, and ACC maintains a gap.

12. A — The vehicle-speed input ADAS uses most commonly originates from the wheel speed sensors processed and broadcast by the brake control module. That module derives and shares road speed. Temperature, fuel level, and light sensors do not provide speed.

13. A — GPS provides the vehicle's geographic position from received satellite timing signals. That position, combined with map data, anticipates curves and limits. It does not measure distance ahead, emit sound pulses, or report steering angle.

14. C — The forward-facing camera mounted at the top of the windshield reads the painted lane lines on the road. Vision is required to interpret lane markings. Rear radar, ultrasonic sensors, and the yaw rate sensor do not read lanes.

15. D — The driver monitoring system uses an interior camera to track driver attention. It watches the driver's face and eye state. Blind-spot, ACC, and park-assist systems sense the vehicle's surroundings, not the driver.

16. A — A static calibration uses fixed targets with the vehicle stationary in a controlled bay. That is the defining characteristic. Driving the vehicle describes dynamic calibration, and static calibration does involve scan tools and controlled bay conditions.

17. A — Most ADAS modules share high-speed data over the CAN bus, a differential network linking the control modules. It is the primary communication backbone. The battery feed, ground system, and antenna grid are not data networks.

18. D — Ultrasonic sensors detect close objects using high-frequency sound, making them best for very close range during low-speed parking. Their short range suits parking. Radar and the camera serve longer ranges, and LiDAR maps in 3D rather than close-range parking.

19. B — The mounting bracket secures the camera in its aimed position on the glass. It physically holds the camera's aim. The lens focuses light, the image processor handles data, and the connector links to the bus.

20. B — Worn or faded markings reduce the contrast the camera needs, impairing reliable lane detection. The camera depends on clear marking contrast. Faded lines do not improve detection, leave it unaffected, or extend range.

21. D — When service information is inadequate, the technician should seek additional manufacturer resources before proceeding with the diagnosis. Proper diagnosis requires adequate information. Replacing the camera, guessing, or clearing codes is not sound practice.

22. D — A new windshield can alter the camera's mounting position and aim relative to the road, which is why calibration is required after replacement. The camera's reference shifts with the glass. It does not change bus speed, supply voltage, or ultrasonic range.

23. B — An obstruction fault calls for first inspecting the windshield area and lens directly in front of the camera. A blocked view in that zone triggers the fault. Rear ultrasonic sensors, the radar bracket, and bus termination are unrelated to a camera-view obstruction.

24. C — Calibration aligns the camera's reference so it reads the road correctly. That is the defining term for aligning aim to the vehicle. Programming loads software, configuration sets options, and initialization clears learned values.

25. B — The forward-facing camera that reads the painted lane markings provides the lane-position data for lane-keeping. Vision supplies the lane reference. Rear radar, ultrasonic sensors, and the yaw rate sensor do not read lane position.

26. D — A smudged or filmed lens will distort or obscure the captured image, degrading detection and calibration. Any coating interferes with the optical path. It does not extend range, improve clarity, or self-recalibrate.

27. B — The correct first step is to verify the concern and research the system's normal operating behavior. This distinguishes a malfunction from normal function. Replacing the camera, recalibrating, or clearing codes first skips verification.

28. A — A windshield-bonded camera bracket means replacement requires correct glass with the bracket and a calibration afterward. The aim depends on proper glass and bracket. The bracket does not stay with the old glass, allow lower mounting, or eliminate calibration.

29. D — An incorrect target will cause the camera to fail to recognize the target, aborting the calibration. The camera needs the specified pattern and contrast. A bad target does not change ultrasonic range, create a short, or improve accuracy.

30. D — The required step to confirm no faults remain is a post-repair scan confirming no related DTCs remain stored. It proves the system is functioning. Resetting oil life, recording climate settings, and topping off washer fluid do not verify the repair.

31. B — A radar sensor works by transmitting radio waves and measuring the reflected return from objects. That return yields distance and closing speed. Sound, light imaging, and satellite signals describe ultrasonic, camera, and GPS respectively.

32. A — When only the forward radar is unreachable while all others respond, the diagnosis should focus on the circuit or connector serving that module specifically. A shared battery or gateway fault would disable many modules. Isolating the loss to one node points to its wiring.

33. B — A small angular mounting error creates a large lateral position error at the radar's far detection range. The error compounds over distance. The angle does not change baud rate, supply voltage, or heater resistance.

34. C — Excess paint or filler attenuates and delays the radar signal passing through the cover material, degrading performance. Radar must penetrate within strict limits. It does not raise supply voltage, change baud rate, or force bus sharing.

35. A — The blind-spot monitoring system uses rear corner radar to detect vehicles beside and behind the car. That is its defining function and sensor. Forward-collision warning looks ahead, park-assist uses ultrasonic, and lane-keeping uses a camera.

36. C — A 120 Ω reading across the ADAS-CAN pair indicates the bus termination is intact and the circuit is configured normally. That nominal value reflects healthy termination. A short reads near zero, an open reads infinite, and a dead battery would not produce this reading.

37. B — The reference the vehicle actually tracks along is the thrust line, established by the rear axle geometry. Radar aim references this true tracking direction. Bumper distance, steering position, and camera axis do not define the thrust line.

38. A — Radar calibration may be static, dynamic, or both, depending on the manufacturer's procedure. The method varies by make and model. It is not strictly one type, nor is it eliminated by self-alignment.

39. B — Corroded terminals must be repaired or replaced to restore the circuit. Corrosion adds resistance and causes intermittent or lost signals. Sealing with filler, raising voltage, or releasing the vehicle fails to fix the connection.

40. C — The composite vehicle reference, which lists the radar's range specification value, is the correct source for the forward radar's maximum detection range. It is authoritative for composite-vehicle data. Labor guides, catalogs, and other-brand experience do not supply this spec.

41. C — A metal parts cart and a vehicle lift within the radar's field are genuine environmental interference aborting an indoor calibration. Reflective surfaces return false signals. A ground drop, target shade, or software revision are not environmental interference.

42. B — A radar dropout only over rough pavement points to a loose connector or mount that breaks electrical contact under vibration. Mechanical disturbance reveals the marginal connection. A calibration file, a fully failed sensor, or "designed muting" would not track vibration.

43. D — A new radar reacting to adjacent-lane vehicles after calibration suggests a residual aim or mounting error skewing the radar's lateral detection. The beam points slightly off, widening coverage. Shipping origin, marginal battery, and disconnected ultrasonic sensors do not explain lateral misdetection.

44. C — Stray reflections during static radar calibration return false signals that corrupt the calibration reference data. The radar cannot separate clutter from its target. Reflections do not lower supply voltage, change heater resistance, or erase codes.

45. A — The manufacturer-specified road test verifies the system performs correctly under actual real-world driving conditions. On-road behavior is the final proof of repair. It does not confirm battery recharge, TPMS relearn, or engine temperature.

46. D — An ultrasonic sensor works by emitting high-frequency sound waves and timing the returning echo from objects. The echo time yields distance. Radio waves, light imaging, and satellite signals describe radar, camera, and GPS respectively.

47. C — The park-assist system uses ultrasonic sensors to detect close-range objects during low-speed parking. That is its defining function and sensor. ACC uses radar ahead, lane-keeping uses a camera, and blind-spot uses rear corner radar.

48. D — The composite vehicle reference document describing the ultrasonic system specs is the authoritative source for the rear sensors' range and pattern. It is the defined reference for composite-vehicle data. Terminal resistance, scaled radar specs, and wheelbase do not provide this.

49. A — Thick paint over an ultrasonic sensor face will dampen the emitted and returning sound waves, reducing detection reliability. The coating blocks the sound energy. Paint does not usefully lengthen echo time, focus the beam, or pass waves freely.

50. B — One erratic sensor among healthy ones is most efficiently diagnosed by checking that sensor's face and connector for obstruction, physical damage, or a loose connection. The fault is localized to that unit. Software revision, bus termination, and radar supply voltage are system-wide factors.