PRACTICE EXAM 8: T6 SIMULATION (50 QUESTIONS)

1. A 2024 heavy-duty truck uses Electronic Stability Control (ESC) integrated with the chassis multiplexed network. The ESC system requires:

A. Direct hardwired connections to all wheel speed sensors

B. A single shared sensor for the entire vehicle

C. Steering angle, yaw rate, and lateral acceleration data over the data bus

D. Independent ESC operation without data bus integration

2. A heavy-duty truck driver assistance system uses a forward-facing camera. The camera typically connects to the vehicle network via:

A. CAN bus or Ethernet for high-bandwidth data

B. Direct hardwired connections to the body controller

C. RF wireless connection to the central module

D. Optical fiber direct to the cluster

3. Tech A says modern heavy-duty trucks may use multiple CAN bus networks at different speeds for different applications. Tech B says high-speed CAN at 500 kbps is used for ABS and ESC while standard J1939 at 250 kbps handles general vehicle data. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

4. A heavy-duty truck with adaptive cruise control uses radar sensing to maintain following distance. The radar module typically:

A. Operates independently without vehicle network integration

B. Communicates with vehicle systems via CAN bus

C. Uses analog voltage signals to the engine ECU

D. Connects directly to the brake system without ECU mediation

5. A 2023 heavy-duty truck uses a 24-volt cranking system with auxiliary 12-volt loads. The truck typically converts 24-volt to 12-volt power using:

A. A DC-DC converter module

B. A center-tap on the battery bank

C. Voltage drop across resistors

D. Direct 12-volt regulation from the alternator

6. Tech A says heavy-duty truck telematics modules typically include cellular modems for remote data transmission. Tech B says modern telematics modules also include GPS receivers for location data. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

7. A heavy-duty truck wiring harness terminal uses a "weather-pack" sealed connector. The proper service procedure for this connector includes:

A. Removing seals before reinstallation to verify cleanliness

B. Lubricating seals with petroleum jelly to ease installation

C. Cleaning with solvent to remove all sealing compound

D. Replacing seals when damaged and verifying weatherproof installation

8. A 2024 heavy-duty truck uses Electronic Logging Devices (ELDs) integrated with the J1939 bus. The ELD captures:

A. Engine hours, vehicle miles, and operational data via the bus

B. Driver fingerprint authentication for log verification

C. Cargo weight and balance data for log entries

D. Fuel quality data from the fuel system

9. Tech A says heavy-duty truck network gateway modules translate between different bus protocols. Tech B says gateway modules also enforce security and access control between networks. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

10. A heavy-duty truck wiring repair requires soldering a connection. The proper soldering procedure includes:

A. Using acid-core solder for stronger joints

B. Using rosin-core solder with proper temperature control

C. Heating the wire above 800°F for proper flow

D. Avoiding heat-shrink protection to allow joint inspection

11. Modern heavy-duty trucks may use CAN-FD (Flexible Data Rate) protocol. CAN-FD provides:

A. Higher data rates within data frames than standard CAN

B. Lower data rates with improved error detection

C. Identical data rates with backward compatibility only

D. Wireless data transmission between modules

12. Tech A says heavy-duty truck wiring harness routing must avoid heat sources, sharp edges, and moving parts. Tech B says proper harness support intervals prevent vibration damage during service life. Who is correct?

A. Neither Tech A nor Tech B

B. Tech A only

C. Tech B only

D. Both Tech A and Tech B

13. A heavy-duty truck uses a "smart junction box" or central electronic module. This component typically:

A. Provides only mechanical fuse and relay mounting

B. Combines fuses, relays, and electronic switching functions

C. Replaces the body controller entirely

D. Operates independently of the vehicle data network

14. The recommended diagnostic approach for emerging technology faults on a heavy-duty truck includes:

A. Replacing the suspected module without diagnostic verification

B. Disconnecting the battery to reset all systems

C. Using OEM-specified scan tools and following diagnostic procedures

D. Bypassing the system to verify operation without it

15. A heavy-duty truck with lithium-ion auxiliary battery for sleeper hotel loads:

A. Requires a battery management system (BMS) for monitoring and control

B. Operates without monitoring like a standard lead-acid battery

C. Uses the same charging profile as the truck's starting batteries

D. Cannot be jump-started under any circumstances

16. Tech A says lithium-ion batteries have higher energy density than lead-acid batteries. Tech B says lithium-ion batteries cost more per amp-hour than lead-acid batteries. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

17. A heavy-duty truck starter motor with integrated solenoid uses which type of solenoid actuation?

A. Mechanical pull-in only

B. Electromagnetic with hold-in and pull-in windings

C. Pneumatic actuation from air system

D. Hydraulic actuation from oil pressure

18. A 2024 heavy-duty truck uses a "soft-start" starter motor. The soft-start feature:

A. Reduces cranking current significantly during all starts

B. Eliminates the need for batteries during starting

C. Reduces peak current draw during initial engagement

D. Allows starting without engine compression assistance

19. Tech A says battery temperature affects state-of-charge measurements significantly. Tech B says cold batteries deliver less cranking current than warm batteries at the same state of charge. Who is correct?

A. Both Tech A and Tech B

B. Tech A only

C. Tech B only

D. Neither Tech A nor Tech B

20. A heavy-duty truck has a battery isolator between the starting and auxiliary battery banks. The isolator's purpose is:

A. To increase total battery capacity for cranking

B. To reduce parasitic draw on the starting batteries

C. To convert 12-volt to 24-volt power between banks

D. To prevent auxiliary loads from discharging the starting batteries

21. The proper procedure for testing a battery management system (BMS) on a lithium-ion auxiliary battery is:

A. Use a standard load tester at full CCA rating

B. Use a hydrometer to measure specific gravity

C. Disconnect the BMS to test the cells directly

D. Use OEM-specified diagnostic procedures and scan tool

22. Tech A says heavy-duty truck batteries should be charged at the lowest practical rate to maximize life. Tech B says modern smart chargers automatically adjust charge rate based on battery condition. Who is correct?

A. Both Tech A and Tech B

B. Tech A only

C. Tech B only

D. Neither Tech A nor Tech B

23. A heavy-duty truck uses an "intelligent" alternator with electronic regulation communicating via the J1939 bus. The alternator:

A. Operates independently of the engine ECU

B. Provides only basic charging without communication

C. Receives charging commands from the engine ECU based on operating conditions

D. Communicates only with the body controller

24. The advantage of intelligent alternator regulation is:

A. Higher peak output at all engine speeds

B. Reduced engine load during high power demand events

C. Elimination of voltage regulation requirements

D. Direct charging without battery connection

25. Tech A says some modern heavy-duty trucks use idle stop-start systems requiring high-cycle batteries. Tech B says stop-start systems require enhanced flooded batteries (EFB) or AGM batteries to handle increased cycling. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

26. A heavy-duty truck alternator with internal regulator uses:

A. A solid-state regulator integrated with the alternator

B. An external mechanical regulator on the firewall

C. No regulation, with output controlled by engine speed

D. A separate computer module for regulation

27. The proper diagnostic procedure for an "intelligent" alternator with bus communication is:

A. Use a standard alternator load tester only

B. Disconnect the bus communication to test independently

C. Use a scan tool to verify charging system commands and feedback

D. Measure output voltage with a multimeter only

28. A heavy-duty truck with multiplexed exterior lighting uses:

A. CAN or LIN bus communication between body controller and chassis nodes

B. Direct hard-wired connections from switches to lamps

C. Wireless RF communication between cab and chassis

D. Power-line carrier signaling on the supply circuits

29. Tech A says LED headlights on heavy-duty trucks may include adaptive functions like dynamic beam control. Tech B says some heavy-duty trucks use matrix LED headlights that selectively dim individual segments. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

30. A heavy-duty truck headlight using HID (High Intensity Discharge) technology requires:

A. A standard 12-volt direct connection

B. A ballast unit to generate the required ignition voltage

C. A larger fuse than incandescent bulbs

D. Constant-current driver like LED systems

31. The advantage of LED matrix headlights over conventional headlights is:

A. Lower power consumption only

B. Selective dimming to avoid blinding oncoming drivers while maintaining visibility

C. Higher beam output only

D. Simpler control circuits

32. Tech A says trailer lighting on modern heavy-duty trucks may use LED technology with low current draw. Tech B says trailer connectors may include diagnostic communication for LED status monitoring. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

33. A heavy-duty truck cab interior lighting system using LED technology typically:

A. Uses PWM dimming control for variable brightness

B. Operates at fixed brightness only

C. Requires constant-voltage power without regulation

D. Cannot be dimmed without bulb replacement

34. The proper diagnostic procedure for a multiplexed lighting system fault includes:

A. Replacing the body controller as the most likely cause

B. Disconnecting the lighting circuits to isolate the issue

C. Replacing each chassis node in sequence

D. Using a scan tool to verify body controller commands and node responses

35. A 2024 heavy-duty truck instrument cluster typically uses:

A. Digital LCD or LED display with reconfigurable layout

B. Analog gauges with mechanical drives only

C. Hardwired analog signals from each sensor

D. Mechanical odometer with analog gauges

36. Tech A says heavy-duty truck telematics modules may include WiFi capability for remote diagnostic access. Tech B says some telematics systems use Bluetooth for driver smartphone integration. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

37. A heavy-duty truck Electronic Stability Control (ESC) warning lamp activates when:

A. The vehicle is parked for extended periods

B. The system detects loss of vehicle stability or system fault

C. The vehicle exceeds posted speed limits

D. The driver depresses the brake pedal hard

38. Tech A says heavy-duty truck Advanced Driver Assistance Systems (ADAS) may include lane departure warning. Tech B says ADAS may also include forward collision warning with automatic braking intervention. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

39. A heavy-duty truck Tire Pressure Monitoring System (TPMS) uses:

A. Wireless sensors in each tire transmitting pressure data

B. A single sensor in the air supply line

C. Mechanical valve stems with visual indicators only

D. Engine ECU calculation from wheel speed signals

40. The proper diagnostic procedure for a TPMS sensor fault is:

A. Replace all four sensors as a complete kit

B. Inflate all tires to maximum pressure to reset sensors

C. Use OEM-specified scan tool to identify the affected sensor

D. Replace the receiver module as the most likely cause

41. A heavy-duty truck Driver Information Display (DID) shows:

A. Real-time vehicle data including fuel economy, engine hours, and trip data

B. Only vehicle speed and engine RPM

C. Only warning lamps without numeric data

D. Mechanical analog readings from each sensor

42. Tech A says heavy-duty truck black box data recorders capture pre-event and post-event data during incidents. Tech B says the captured data includes engine RPM, vehicle speed, brake application, and other operating parameters. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

43. A heavy-duty truck network gateway provides:

A. Only mechanical wire termination between buses

B. Direct connection between all networks without filtering

C. Replacement for the body controller in all functions

D. Translation, filtering, and security between vehicle networks

44. The proper diagnostic procedure for an ADAS camera fault includes:

A. Replacing the camera without diagnostic verification

B. Using OEM-specified scan tool and following calibration procedures

C. Disconnecting the camera to verify system operation without it

D. Cleaning the camera lens as the only required action

45. Tech A says modern heavy-duty truck instrument clusters include configurable warning lamps with software-defined functions. Tech B says cluster software updates may add new warning lamp functions during the truck's service life. Who is correct?

A. Both Tech A and Tech B

B. Tech A only

C. Tech B only

D. Neither Tech A nor Tech B

46. A heavy-duty truck Electronic Logging Device (ELD) typically:

A. Operates independently of the vehicle data network

B. Connects to the OBD-II diagnostic port only

C. Uses cellular wireless to transmit logs to drivers

D. Connects to the J1939 bus to capture engine and operational data

47. The proper procedure for replacing a heavy-duty truck instrument cluster on a modern multiplexed truck is:

A. Direct plug-and-play installation with no programming

B. Disconnecting all sensors before installation

C. Programming the new cluster with truck-specific configuration data

D. Reflashing all other modules after cluster installation

48. Tech A says heavy-duty truck telematics data is typically stored in the cloud for fleet management access. Tech B says telematics data also includes location, speed, and driver behavior information. Who is correct?

A. Both Tech A and Tech B

B. Tech A only

C. Tech B only

D. Neither Tech A nor Tech B

49. A heavy-duty truck collision avoidance system uses radar and camera fusion. The fusion process:

A. Uses radar data only with camera as backup

B. Combines radar distance with camera object recognition for confidence in detection

C. Uses camera data only with radar as backup

D. Operates each sensor independently without fusion

50. The proper diagnostic approach for a heavy-duty truck with multiple emerging-technology systems showing faults is:

A. Replace the most expensive module first as the likely cause

B. Disconnect all systems to isolate one at a time

C. Reflash all modules to update software

D. Use OEM scan tool to read fault codes from all modules and follow systematic diagnosis

PRACTICE EXAM 8: ANSWER KEY AND EXPLANATIONS

1. C — Steering angle, yaw rate, and lateral acceleration data over the data bus. Electronic Stability Control requires multiple sensor inputs (steering angle, yaw rate, lateral acceleration) communicated over the data bus to detect and correct vehicle instability. Direct hardwired sensor connections are not used in modern multiplexed architectures.

2. A — CAN bus or Ethernet for high-bandwidth data. Heavy-duty truck driver assistance camera data requires high bandwidth that traditional CAN cannot support, so CAN-FD or Ethernet is used for camera data transmission. Standard J1939 at 250 kbps is inadequate for camera image data.

3. D — Both Tech A and Tech B. Modern heavy-duty trucks use multiple CAN bus networks at different speeds for different applications, with high-speed CAN at 500 kbps for ABS and ESC requiring fast response, and standard J1939 at 250 kbps for general vehicle data. This multi-network architecture is standard on modern trucks.

4. B — Communicates with vehicle systems via CAN bus. Adaptive cruise control radar modules communicate with vehicle systems (engine, transmission, brakes) via CAN bus to maintain following distance through coordinated control. Direct hardwired or analog connections are not used in modern systems.

5. A — A DC-DC converter module. Heavy-duty trucks with 24-volt cranking and 12-volt auxiliary loads use a DC-DC converter module to step down voltage efficiently. Center-tap configurations are not preferred because they unbalance battery loads, and resistors waste excessive power.

6. C — Both Tech A and Tech B. Modern heavy-duty truck telematics modules typically include cellular modems for remote data transmission to fleet management servers. Telematics modules also include GPS receivers for location data, providing real-time vehicle tracking and route information.

7. D — Replacing seals when damaged and verifying weatherproof installation. Weather-pack sealed connectors require seal replacement when damaged and verification of weatherproof installation, since the seals are critical to long-term electrical reliability. Removing seals or using improper lubricants damages the sealing function.

8. A — Engine hours, vehicle miles, and operational data via the bus. Electronic Logging Devices integrated with the J1939 bus capture engine hours, vehicle miles, and operational data required for hours-of-service compliance. Other data (fingerprints, cargo weight, fuel quality) are not typical ELD functions.

9. C — Both Tech A and Tech B. Heavy-duty truck network gateway modules translate between different bus protocols (J1939, CAN-FD, LIN, Ethernet) to enable communication across the vehicle. Gateway modules also enforce security and access control between networks, preventing unauthorized access to safety-critical systems.

10. B — Using rosin-core solder with proper temperature control. Heavy-duty wiring repair soldering uses rosin-core solder with proper temperature control to produce clean, mechanically strong joints. Acid-core solder corrodes wiring; excessive temperature damages insulation and wire properties; heat-shrink protection is essential for joint integrity.

11. A — Higher data rates within data frames than standard CAN. CAN-FD (Flexible Data Rate) provides higher data rates within data frames than standard CAN, allowing more data to be transmitted in less time. CAN-FD maintains compatibility with existing CAN infrastructure while supporting higher-bandwidth applications like cameras.

12. D — Both Tech A and Tech B. Heavy-duty truck wiring harness routing must avoid heat sources, sharp edges, and moving parts to prevent insulation damage and abrasion. Proper harness support intervals (typically every 12-18 inches) prevent vibration damage during service life by reducing flex amplitude.

13. B — Combines fuses, relays, and electronic switching functions. Smart junction boxes combine traditional fuses and relays with electronic switching functions, providing centralized power distribution with intelligence. They typically interface with the body controller and integrate diagnostic capabilities.

14. C — Using OEM-specified scan tools and following diagnostic procedures. Emerging technology faults require OEM-specified scan tools and diagnostic procedures because these systems use proprietary protocols and complex algorithms. Generic approaches and component replacement without diagnostic verification are inadequate for these systems.

15. A — Requires a battery management system (BMS) for monitoring and control. Lithium-ion auxiliary batteries require a battery management system (BMS) for cell monitoring, balancing, charge/discharge control, and safety protection. Operating without BMS risks thermal runaway and fire.

16. D — Both Tech A and Tech B. Lithium-ion batteries have significantly higher energy density than lead-acid batteries (typically 4-6x), providing more capacity per pound. Lithium-ion batteries cost more per amp-hour than lead-acid batteries, with the higher cost balanced against longer service life and weight savings.

17. B — Electromagnetic with hold-in and pull-in windings. Heavy-duty truck starter motors with integrated solenoids use electromagnetic actuation with hold-in and pull-in windings, providing reliable engagement and current management during cranking. Pneumatic and hydraulic actuation are not used in standard starter applications.

18. C — Reduces peak current draw during initial engagement. Soft-start starter motors reduce peak current draw during initial engagement through controlled engagement profiles, reducing stress on batteries, cables, and starter components. This feature extends component life without significantly affecting cranking effectiveness.

19. A — Both Tech A and Tech B. Battery temperature affects state-of-charge measurements significantly because electrolyte density and chemistry change with temperature. Cold batteries deliver less cranking current than warm batteries at the same state of charge because reduced chemical reaction rates limit current capability.

20. D — To prevent auxiliary loads from discharging the starting batteries. Battery isolators separate starting and auxiliary battery banks to prevent auxiliary loads (sleeper appliances, accessories) from discharging the starting batteries. The isolator allows charging current to flow to both banks while preventing discharge crossover.

21. D — Use OEM-specified diagnostic procedures and scan tool. Battery management systems on lithium-ion auxiliary batteries require OEM-specified diagnostic procedures and scan tools because BMS communication is proprietary and standard testing methods are not applicable. Standard load testers, hydrometers, and BMS bypass methods can damage cells.

22. A — Both Tech A and Tech B. Heavy-duty truck batteries should be charged at the lowest practical rate to maximize life by minimizing electrolyte loss and plate damage. Modern smart chargers automatically adjust charge rate based on battery condition, providing optimal charging without operator intervention.

23. C — Receives charging commands from the engine ECU based on operating conditions. Intelligent alternators with J1939 bus communication receive charging commands from the engine ECU based on operating conditions (battery state of charge, electrical demand, fuel economy optimization). This allows coordinated control between charging and other systems.

24. B — Reduced engine load during high power demand events. Intelligent alternator regulation provides reduced engine load during high power demand events by temporarily reducing alternator output, which improves fuel economy and engine performance during acceleration. Output is increased during deceleration and idle to compensate.

25. D — Both Tech A and Tech B. Modern heavy-duty trucks may use idle stop-start systems requiring high-cycle batteries that withstand frequent start cycles. These systems require enhanced flooded batteries (EFB) or AGM batteries because standard flooded batteries cannot handle the increased cycling without rapid degradation.

26. A — A solid-state regulator integrated with the alternator. Heavy-duty alternators with internal regulators use solid-state regulators integrated with the alternator, providing compact and reliable voltage control. External mechanical regulators are obsolete for this application.

27. C — Use a scan tool to verify charging system commands and feedback. Intelligent alternator diagnosis requires a scan tool to verify charging system commands from the engine ECU and feedback from the alternator, since traditional load testing alone cannot evaluate the bus communication. Multimeter-only testing misses the communication aspect of the system.

28. A — CAN or LIN bus communication between body controller and chassis nodes. Multiplexed exterior lighting on heavy-duty trucks uses CAN or LIN bus communication between the body controller and chassis nodes that drive individual lamp circuits. This architecture eliminates point-to-point wiring and enables advanced features.

29. D — Both Tech A and Tech B. LED headlights on heavy-duty trucks may include adaptive functions like dynamic beam control that adjust beam pattern based on driving conditions. Some heavy-duty trucks use matrix LED headlights that selectively dim individual segments to avoid blinding oncoming drivers while maintaining visibility elsewhere.

30. B — A ballast unit to generate the required ignition voltage. HID headlights require a ballast unit to generate the high voltage (20,000 volts or more) needed to ignite the gas discharge, then regulate the lower voltage required for sustained operation. Standard 12-volt connections cannot provide the required ignition voltage.

31. B — Selective dimming to avoid blinding oncoming drivers while maintaining visibility. LED matrix headlights provide selective dimming to avoid blinding oncoming drivers while maintaining visibility in other areas, improving night driving safety. This is a primary advantage over conventional headlights.

32. C — Both Tech A and Tech B. Modern heavy-duty truck trailer lighting may use LED technology with low current draw, reducing electrical load and improving reliability. Trailer connectors may include diagnostic communication for LED status monitoring, allowing the system to detect lamp failures before driver complaints.

33. A — Uses PWM dimming control for variable brightness. Heavy-duty truck cab interior LED lighting typically uses PWM dimming control for variable brightness, allowing dashboard dimming and accent lighting effects. Constant-voltage operation without regulation does not provide dimming capability.

34. D — Using a scan tool to verify body controller commands and node responses. Multiplexed lighting system fault diagnosis uses a scan tool to verify body controller commands and node responses, isolating whether the fault is in the controller, the network, or the chassis nodes. Component replacement without diagnostic verification is inefficient.

35. A — Digital LCD or LED display with reconfigurable layout. Modern heavy-duty truck instrument clusters use digital LCD or LED displays with reconfigurable layout, allowing drivers to select displayed information and supporting software updates that add new functions. Analog gauges and hardwired signals are obsolete for new trucks.

36. C — Both Tech A and Tech B. Heavy-duty truck telematics modules may include WiFi capability for remote diagnostic access in the shop or yard. Some telematics systems use Bluetooth for driver smartphone integration, providing applications for drivers to monitor truck status and communication.

37. B — The system detects loss of vehicle stability or system fault. ESC warning lamps activate when the system detects loss of vehicle stability requiring intervention or when a system fault prevents proper operation. The lamp provides driver awareness of safety system status.

38. D — Both Tech A and Tech B. Heavy-duty truck Advanced Driver Assistance Systems may include lane departure warning to alert drivers when the truck drifts from its lane without signaling. ADAS may also include forward collision warning with automatic braking intervention to mitigate or prevent rear-end collisions.

39. A — Wireless sensors in each tire transmitting pressure data. Heavy-duty truck Tire Pressure Monitoring Systems use wireless sensors in each tire that transmit pressure data to a receiver module, providing real-time pressure monitoring for safety and tire life. Direct mechanical or calculated pressure systems are not used.

40. C — Use OEM-specified scan tool to identify the affected sensor. TPMS sensor faults require OEM-specified scan tools to identify the specific affected sensor, since multiple sensors are present and proper identification is required for replacement. Wholesale sensor or receiver replacement without diagnosis is inefficient.

41. A — Real-time vehicle data including fuel economy, engine hours, and trip data. Heavy-duty truck Driver Information Displays show real-time vehicle data including fuel economy, engine hours, trip data, and operational metrics, providing comprehensive information beyond basic gauges. This information supports driver awareness and operational efficiency.

42. C — Both Tech A and Tech B. Heavy-duty truck black box data recorders capture pre-event and post-event data during incidents (typically 30 seconds before and after). The captured data includes engine RPM, vehicle speed, brake application, and other operating parameters used for accident reconstruction and analysis.

43. D — Translation, filtering, and security between vehicle networks. Heavy-duty truck network gateways provide translation between different bus protocols, filtering of messages to reduce network load, and security to prevent unauthorized access to safety-critical systems. This combination of functions is essential for modern multi-network architectures.

44. B — Using OEM-specified scan tool and following calibration procedures. ADAS camera fault diagnosis requires OEM-specified scan tools and calibration procedures because these systems use proprietary algorithms and require precise calibration after any service. Lens cleaning alone does not address electronic faults.

45. A — Both Tech A and Tech B. Modern heavy-duty truck instrument clusters include configurable warning lamps with software-defined functions, allowing customization for different applications and operations. Cluster software updates may add new warning lamp functions during the truck's service life as systems are added or updated.

46. D — Connects to the J1939 bus to capture engine and operational data. Electronic Logging Devices on heavy-duty trucks connect to the J1939 bus to capture engine and operational data required for hours-of-service compliance. The J1939 connection provides standardized access to all required data.

47. C — Programming the new cluster with truck-specific configuration data. Modern multiplexed truck instrument cluster replacement requires programming the new cluster with truck-specific configuration data (VIN, mileage, options, calibration). Plug-and-play installation does not complete the service on multiplexed trucks.

48. A — Both Tech A and Tech B. Heavy-duty truck telematics data is typically stored in the cloud for fleet management access from any location with internet connectivity. Telematics data includes location, speed, driver behavior, and operational metrics, providing comprehensive fleet visibility.

49. B — Combines radar distance with camera object recognition for confidence in detection. Sensor fusion in collision avoidance systems combines radar distance measurement with camera object recognition to increase confidence in detection and reduce false alarms. Radar provides accurate distance; camera provides object classification.

50. D — Use OEM scan tool to read fault codes from all modules and follow systematic diagnosis. Multiple emerging-technology fault diagnosis requires an OEM scan tool to read fault codes from all modules followed by systematic diagnosis based on the codes and symptoms. Component replacement, system disconnect, or wholesale reflashing without diagnosis is inefficient and may not address the underlying issues.