PRACTICE EXAM 3: T6 SIMULATION (50 QUESTIONS)

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1. A heavy-duty truck circuit shows 12.6 volts at the source and 11.8 volts at the load with the circuit energized. The next diagnostic step should be:

A. Replace the load device immediately

B. Measure voltage drop on the power and ground sides separately

C. Replace the circuit fuse to restore voltage

D. Disconnect the battery to reset the circuit

2. A parasitic draw test shows 350 milliamps with the truck in sleep mode. The OEM specification is 50 milliamps maximum. The next step should be:

A. Replace the body control module immediately

B. Disconnect the battery to clear the draw condition

C. Drive the truck to allow the system to reset itself

D. Pull fuses one at a time to isolate the offending circuit

3. A digital multimeter reads 12.6 volts when measuring battery voltage but 0.0 volts when measuring across a fuse with the circuit energized. The conclusion is:

A. The fuse is functioning correctly with no voltage drop

B. The fuse has blown and current is not flowing

C. The fuse has high resistance and requires replacement

D. The meter is set to the incorrect range for the test

4. A circuit shows 12.6 volts at the load with the switch in the OFF position. The first diagnostic step should be:

A. Replace the controlling switch as the most likely cause

B. Measure current draw to verify the load is energized

C. Trace the wiring for an unintended power source

D. Replace the load device to isolate the fault

5. A heavy-duty truck circuit fuse blows immediately when replaced. The next step should be:

A. Disconnect the load and check for a short to ground

B. Install a higher-rated fuse to handle the current

C. Bypass the fuse with a jumper to test the load

D. Replace the fuse with the same rating multiple times

6. A voltage drop test on the ground side of a circuit shows 1.8 volts. The OEM specification is 0.2 volts maximum. The most likely cause is:

A. Open ground connection at the load device

B. Failed load device drawing excessive current

C. Short to ground in the power side of the circuit

D. Corroded or loose ground connection in the circuit

7. Tech A says a circuit with high resistance produces low current and dim load operation. Tech B says a circuit with a short to ground produces high current and blown fuses. Who is correct?

A. Tech A only

B. Both Tech A and Tech B

C. Tech B only

D. Neither Tech A nor Tech B

8. A heavy-duty truck circuit operates intermittently with no consistent fault pattern. The next diagnostic step should be:

A. Replace the load device because intermittent operation indicates internal failure

B. Replace the controlling switch because intermittent operation indicates switch wear

C. Wiggle-test the wiring while monitoring circuit operation for change

D. Disconnect the battery to reset the intermittent fault condition

9. A relay fails to close when activated. Bench testing shows the relay coil reads 75 ohms. The OEM specification is 70 to 80 ohms. The next step should be:

A. Apply 12 volts to the coil and verify mechanical actuation

B. Replace the relay because coil resistance is at the upper limit

C. Replace the relay because intermittent failures cannot be diagnosed

D. Apply 24 volts to the coil to verify maximum actuation force

10. A circuit with a 30-amp fuse and a load rated at 20 amps continuously blows the fuse. The next step should be:

A. Install a 40-amp fuse to handle the load demand

B. Replace the load with a higher-rated component

C. Measure actual current draw to identify the cause

D. Bypass the fuse with a jumper to test the circuit

11. A heavy-duty truck circuit shows reduced voltage at the load with the circuit energized. Power-side voltage drop is 0.1 volts; ground-side voltage drop is 0.1 volts. The next step should be:

A. Replace the wiring harness because of cumulative drops

B. Replace the load device because supply is correct

C. Verify the load is operating correctly with verified supply

D. Replace the connectors at both ends of the circuit

12. Tech A says a "next-step" diagnostic approach starts with the cheapest, easiest tests first. Tech B says the goal is to confirm or eliminate one cause before moving to the next test. 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

13. A circuit operates at reduced voltage. Source voltage is normal at 12.6 volts. The first item to check before component replacement is:

A. Verify the load device is the correct part number for the application

B. Replace the controlling switch as a common high-resistance source

C. Measure current draw to identify excessive load conditions

D. Measure voltage drop on power and ground sides under load

14. A heavy-duty truck has multiple intermittent electrical faults across different circuits. The most likely common cause is:

A. Multiple module failures producing simultaneous faults

B. A primary power or ground connection issue affecting multiple circuits

C. A failed engine ECU causing communication issues across the network

D. Multiple sensor failures producing simultaneous fault codes

15. A heavy-duty truck cranks slowly. Battery voltage is 12.6 volts before cranking and drops to 8.0 volts during cranking. The next step should be:

A. Replace the starter motor as the primary cause

B. Replace all batteries because of the voltage drop

C. Perform a load test on the batteries to verify capacity

D. Replace the battery cables to restore voltage

16. A starter motor draws 350 amps during cranking on a Class 8 truck. The OEM specification is 500 to 800 amps. The next step should be:

A. Verify battery condition because low current indicates supply issues

B. Replace the starter motor because current draw is below specification

C. Replace the starter solenoid because of inadequate engagement

D. Replace the battery cables because of high resistance

17. Tech A says that low cranking current with full battery voltage indicates a supply or cable issue. Tech B says that high cranking current with reduced cranking speed indicates a starter or engine issue. 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

18. A heavy-duty truck shows 12.0 volts open-circuit on a flooded battery after charging for 30 minutes. The next step should be:

A. Return the battery to service as fully charged

B. Continue charging until voltage stabilizes at full charge

C. Replace the battery because charging failed to restore voltage

D. Load test the battery immediately at full CCA rating

19. A battery shows 12.6 volts open-circuit but fails the load test at 8.5 volts after 15 seconds. The conclusion is:

A. The battery is fully charged and functioning correctly

B. The battery requires additional charging before retest

C. The battery is partially discharged but serviceable

D. The battery has lost capacity and requires replacement

20. A starter motor cranks normally when cold but cranks slowly when the engine is hot. The most likely cause is:

A. Heat-induced high resistance in the starter solenoid contacts

B. Discharged batteries unable to maintain voltage when hot

C. Failed starter motor with bearing wear when hot

D. Failed alternator unable to maintain charge during operation

21. Tech A says a slow-crank complaint requires battery testing before starter testing. Tech B says battery cable voltage drop testing is required even when batteries pass load testing. 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

22. A heavy-duty truck has had three starter motor replacements in 200,000 miles. The next diagnostic step should be:

A. Replace all batteries because repeated starter failures indicate supply issues

B. Replace the wiring harness because of accumulated damage

C. Verify battery condition, cable voltage drops, and engine cranking load

D. Replace the engine because high cranking load is destroying starters

23. A heavy-duty truck alternator output is 13.2 volts at idle with no load. The OEM specification is 13.8 to 14.5 volts. The next step should be:

A. Replace the alternator immediately as the primary cause

B. Increase engine RPM and recheck output voltage

C. Replace the voltage regulator without further testing

D. Replace the battery because of low voltage

24. A heavy-duty truck shows AC ripple of 1.2 volts AC at the alternator output. The OEM specification is 0.5 volts AC maximum. The most likely cause is:

A. Failed voltage regulator producing oscillating output

B. Failed stator winding producing variable output

C. Loose drive belt allowing alternator slip

D. Failed diode in the alternator rectifier bridge

25. Tech A says that low alternator output requires verification of belt tension before component replacement. Tech B says alternator output testing should be performed at multiple engine RPMs to characterize regulation. 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

26. A heavy-duty truck alternator shows 14.2 volts output at idle with no load but only 12.8 volts at idle with full electrical load. The next step should be:

A. Replace the alternator because output drops under load

B. Replace the voltage regulator because regulation fails under load

C. Increase engine RPM under load and verify regulation

D. Replace the battery because supply drops under load

27. A heavy-duty truck has had two alternator replacements in 150,000 miles. The next diagnostic step should be:

A. Replace the wiring harness to address potential hidden damage

B. Verify charging system load, drive belt, and battery condition

C. Replace the engine ECU because of communication issues

D. Replace the starter motor because of coincidental wear

28. A heavy-duty truck has both headlights inoperative on low beam but operating normally on high beam. The most likely cause is:

A. Failed headlight bulbs on both low-beam filaments

B. Open ground at both headlight assemblies

C. Failed headlight switch with internal damage

D. Open in the low-beam circuit common to both lamps

29. A trailer lighting connector shows 12 volts at all positions when tested with a multimeter, but the trailer lights do not operate when connected. The next step should be:

A. Replace the trailer wiring harness because of accumulated damage

B. Replace the seven-way connector because of high resistance

C. Test the trailer connector under load with a test light or known load

D. Replace the trailer lighting bulbs because of simultaneous failure

30. A heavy-duty truck has flickering tail lights that vary in intensity. The most likely cause is:

A. High resistance in the tail light power feed or ground

B. Failed body control module commanding the lights incorrectly

C. Open in the tail light circuit interrupting power flow

D. Failed tail light bulbs with damaged filaments

31. Tech A says LED retrofit lighting may require load resistors to maintain proper flasher function. Tech B says LED tail lamps draw approximately 10 percent of the current of equivalent incandescent bulbs. 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

32. A heavy-duty truck headlight shows reduced brightness compared to the other side. Voltage at the dim headlight reads 10.8 volts; voltage at the normal headlight reads 12.4 volts. The next step should be:

A. Measure voltage drop on the dim headlight power feed and ground

B. Replace the dim headlight bulb because of reduced brightness

C. Replace the dim headlight assembly because of internal damage

D. Replace the headlight switch because of variable output

33. A heavy-duty truck shows all marker lights inoperative on the trailer but tractor lights work normally. The first diagnostic step should be:

A. Replace the trailer wiring harness because of accumulated damage

B. Replace the marker light bulbs because of simultaneous failure

C. Inspect the seven-way connector and trailer pigtail for damage

D. Replace the body control module because of network failure

34. A heavy-duty truck stop lamp circuit shows continuity from the brake switch to the lamp position with the pedal depressed, but the lamp does not illuminate. The next step should be:

A. Replace the brake switch because of contact wear

B. Verify ground integrity at the lamp position

C. Replace the lamp because of bulb failure

D. Replace the wiring harness because of hidden damage

35. A heavy-duty truck instrument cluster shows all gauges erratic. Power and ground at the cluster are verified normal. The next diagnostic step should be:

A. Replace the cluster because of internal failure

B. Replace each affected sensor in sequence

C. Reflash the engine ECU to restore communication

D. Verify J1939 data bus communication and integrity

36. A scan tool reports "no communication" with all modules on a heavy-duty truck. Resistance between CAN-H and CAN-L measures 60 ohms with the system de-energized. The next step should be:

A. Verify scan tool connection and bus voltage at the diagnostic connector

B. Replace one of the terminating resistors because of a bus fault

C. Replace the engine ECU because of network communication failure

D. Replace the body control module because of network failure

37. A heavy-duty truck temperature gauge reads in the red zone. Engine actual temperature verified normal with infrared thermometer. The next step should be:

A. Replace the engine thermostat because of incorrect temperature

B. Replace the cluster because of incorrect display

C. Verify temperature sender signal with a scan tool or multimeter

D. Replace the wiring harness because of signal corruption

38. A heavy-duty truck check engine lamp is illuminated. A scan tool retrieves an active code for engine coolant temperature sensor. The next step should be:

A. Replace the temperature sensor immediately as the primary cause

B. Verify sensor signal voltage with a multimeter at the sensor connector

C. Replace the engine ECU because of code generation

D. Clear the code and verify it does not return

39. Tech A says fault codes should be retrieved before any component replacement on a heavy-duty truck. Tech B says fault codes should be cleared after verified repair to confirm the issue is resolved. 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

40. A J1939 bus measurement shows 120 ohms between CAN-H and CAN-L with the system de-energized. The conclusion is:

A. Both terminating resistors are functioning correctly

B. The bus has a short between CAN-H and CAN-L

C. One terminating resistor is open or missing

D. The bus is functioning correctly with proper resistance

41. A heavy-duty truck shows multiple unrelated fault codes from different modules. The next step should be:

A. Replace each module reporting codes in sequence

B. Verify primary power and ground connections at the battery and chassis

C. Reflash all affected modules to clear the faults

D. Replace the wiring harness because of accumulated damage

42. A heavy-duty truck instrument cluster receives no data from the engine ECU but receives data from the ABS module. The next step should be:

A. Replace the engine ECU because of communication failure

B. Replace the cluster because of selective communication failure

C. Verify data bus continuity between the cluster and the engine ECU

D. Verify the engine ECU is broadcasting on the J1939 bus

43. Tech A says that intermittent communication faults often trace to bus wiring or connector issues. Tech B says intermittent communication faults can also trace to module power supply issues during operation. 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

44. A heavy-duty truck shows a low-air pressure warning lamp with verified normal air pressure. The next step should be:

A. Replace the warning lamp because of false illumination

B. Replace the air compressor because of pressure issues

C. Verify the low-air pressure switch signal with a scan tool or multimeter

D. Replace the body control module because of false signal

45. A heavy-duty truck speedometer reads zero with the truck moving. The next step should be:

A. Verify speed sensor signal at the cluster input

B. Replace the speedometer because of internal failure

C. Replace the engine ECU because of communication failure

D. Replace the speed sensor because of signal failure

46. A heavy-duty truck instrument cluster has been replaced. The new cluster does not display correct mileage. The most likely cause is:

A. Failed cluster from the supplier with internal damage

B. Damaged data bus wiring causing communication issues

C. Incorrect cluster part number for the application

D. Cluster requires programming with truck-specific configuration

47. Tech A says a scan tool can be used to read live data values from sensors and modules. Tech B says scan tool live data is more useful than stored fault codes for diagnosing intermittent issues. Who is correct?

A. Tech A only

B. Neither Tech A nor Tech B

C. Both Tech A and Tech B

D. Tech B only

48. A heavy-duty truck warning lamp activates briefly during start-up and then turns off. The conclusion is:

A. The warning system has a fault that is self-clearing

B. The warning system is performing a normal bulb-check function

C. The warning system has an intermittent fault during start-up

D. The warning system has a power supply issue at start-up

49. A heavy-duty truck telematics module is not transmitting data to the fleet management system. The first diagnostic step should be:

A. Replace the telematics module because of transmission failure

B. Replace the cellular antenna because of signal issues

C. Reflash the telematics module to restore transmission

D. Verify cellular signal strength and network registration

50. A heavy-duty truck with multiple recent fault codes after a battery replacement shows all codes clear after a scan tool clear command. The next step should be:

A. Return the truck to service and monitor for code reappearance

B. Replace the battery because of voltage transient damage

C. Replace each affected module because of code generation

D. Reflash all affected modules to prevent future issues

PRACTICE EXAM 3: ANSWER KEY AND EXPLANATIONS

1. B — Measure voltage drop on the power and ground sides separately. A 0.8-volt loss between source and load indicates resistance somewhere in the circuit, and isolating the drop to the power side or ground side is the next diagnostic step. Component replacement before locating the resistance source is premature.
2. D — Pull fuses one at a time to isolate the offending circuit. Excessive parasitic draw is isolated by sequentially pulling fuses while monitoring current draw, which identifies the specific circuit drawing excess current. Component replacement without isolation is wasteful and rarely resolves the issue.
3. A — The fuse is functioning correctly with no voltage drop. A reading of 0.0 volts across an energized fuse indicates no voltage drop, confirming the fuse is intact and current is flowing through it normally. A blown fuse would show source voltage on one side and zero on the other, producing a measurement equal to source voltage across the fuse.
4. C — Trace the wiring for an unintended power source. Voltage at a load with the controlling switch OFF indicates power is reaching the load through an unintended path, typically a short or wiring error from another circuit. Tracing the wiring identifies the unintended source before component replacement.
5. A — Disconnect the load and check for a short to ground. A fuse that blows immediately on replacement indicates a short circuit drawing excessive current, and disconnecting the load isolates whether the short is in the load itself or in the wiring. Higher-rated fuses or jumpers risk fire and component damage.
6. D — Corroded or loose ground connection in the circuit. Ground-side voltage drop of 1.8 volts (vs 0.2 specification) indicates high resistance in the ground path, most commonly from corrosion or loose ground fasteners. Open grounds produce no current flow; load issues affect the load side, not the ground.
7. B — Both Tech A and Tech B. High resistance reduces current flow and produces dim load operation because Ohm's Law ($I = V \div R$) shows current decreases as resistance increases. A short to ground creates a low-resistance path that produces high current and blows fuses to protect the wiring from damage.
8. C — Wiggle-test the wiring while monitoring circuit operation for change. Intermittent faults are diagnosed by wiggling wiring, connectors, and components while monitoring circuit operation,

which reveals connection-related faults that fixed-position testing misses. Component replacement before isolation is wasteful.

9. A — Apply 12 volts to the coil and verify mechanical actuation. A relay coil within specification (75 ohms vs 70-80 spec) requires actuation testing to verify the relay closes mechanically when energized. Bench testing with 12 volts confirms whether the relay is functional or has internal mechanical failure.

10. C — Measure actual current draw to identify the cause. A fuse blowing at 30 amps with a 20-amp rated load indicates the load is drawing more than rated current, and measuring actual draw quantifies the excess and identifies the cause. Higher fuses, load replacement, or jumpers all bypass the diagnostic step.

11. C — Verify the load is operating correctly with verified supply. Power-side and ground-side drops are within specification (0.1 volts each), confirming the supply circuit is functional. The next step is to verify the load is operating correctly with the verified supply, since the supply has been ruled out as the cause.

12. A — Both Tech A and Tech B. Diagnostic procedure starts with the cheapest, easiest tests first to minimize time and parts cost on simple causes, and the goal of each test is to confirm or eliminate one cause before moving on. Both principles are foundational to systematic diagnosis.

13. D — Measure voltage drop on power and ground sides under load. With normal source voltage and reduced load voltage, the next step is voltage drop testing on both sides under load to locate resistance. Component replacement before locating the resistance is premature; current measurement identifies excess load, not resistance faults.

14. B — A primary power or ground connection issue affecting multiple circuits. Multiple unrelated intermittent faults across different circuits commonly trace to a primary power or ground fault that affects multiple modules and circuits simultaneously. Multiple simultaneous component failures are statistically unlikely.

15. C — Perform a load test on the batteries to verify capacity. Voltage dropping from 12.6 to 8.0 volts during cranking indicates the batteries cannot maintain voltage under load, and a load test verifies whether the batteries have lost capacity. Replacement before verification may not resolve the underlying issue.

16. A — Verify battery condition because low current indicates supply issues. Cranking current of 350 amps below the 500-800 specification indicates inadequate current available, which traces to battery capacity or cable resistance issues, not the starter itself. The starter would draw rated current if the supply were adequate.

17. D — Both Tech A and Tech B. Low cranking current with full battery voltage points to a supply or cable resistance issue limiting current flow to the starter. High cranking current with reduced

cranking speed indicates the starter is loaded down by internal damage or excessive engine resistance. Both characterizations are correct.

18. B — Continue charging until voltage stabilizes at full charge. A flooded battery at 12.0 volts after 30 minutes of charging is significantly undercharged, and continued charging is required before any testing or service decisions. Load testing or replacement decisions on undercharged batteries produce false results.

19. D — The battery has lost capacity and requires replacement. A fully charged battery (12.6 volts) failing the load test at 8.5 volts (below the 9.6-volt minimum at 70°F) indicates lost capacity. The battery cannot be restored by additional charging because the open-circuit voltage already reads full charge.

20. A — Heat-induced high resistance in the starter solenoid contacts. Slow cranking only when hot is the classic signature of heat-induced contact resistance in the starter solenoid, where thermal expansion increases contact resistance and reduces voltage at the starter motor. Cold-condition normal operation rules out other failure modes.

21. A — Both Tech A and Tech B. Slow-crank diagnosis requires battery testing first because batteries are the most common cause and the cheapest item to verify. Cable voltage drop testing is required even with passing battery tests because cables can develop high resistance that load testing alone does not detect.

22. C — Verify battery condition, cable voltage drops, and engine cranking load. Repeat starter failures point to a system-side cause that destroys each new starter, and verification of supply (batteries, cables) and load (engine cranking resistance) identifies the underlying issue. Component replacement without verification continues the failure cycle.

23. B — Increase engine RPM and recheck output voltage. Alternator output at idle (13.2 volts) below specification (13.8-14.5) may indicate the alternator is not at rated speed for full output, and increasing RPM verifies whether the unit produces specification voltage at higher speeds. Component replacement before RPM verification is premature.

24. D — Failed diode in the alternator rectifier bridge. AC ripple of 1.2 volts (vs 0.5 maximum) indicates one or more rectifier diodes have failed, allowing AC voltage to pass through to the DC output. Failed diodes are the typical cause of excessive AC ripple in heavy-duty alternators.

25. A — Both Tech A and Tech B. Belt tension affects alternator output speed and must be verified before condemning the alternator for low output, since a slipping belt produces low output regardless of alternator condition. Output testing at multiple RPMs characterizes regulation behavior and identifies regulator vs. capacity issues.

26. C — Increase engine RPM under load and verify regulation. Output dropping under load at idle may indicate the alternator is below rated speed for full load output, and verifying regulation at

higher RPM determines whether the alternator can produce specification voltage when properly driven. Many heavy-duty alternators require above-idle RPM for full rated output.

27. B — Verify charging system load, drive belt, and battery condition. Repeat alternator failures point to system-side causes that destroy each new alternator, and verification of load demand, belt condition, and battery condition identifies the underlying issue. Each new alternator fails for the same reason if the underlying cause is not addressed.

28. D — Open in the low-beam circuit common to both lamps. Both lamps inoperative on the same beam (low) but operational on the other beam (high) indicates a circuit fault common to both lamps in the failed mode. The low-beam circuit feeds both lamps from a common point, and an open in this circuit disables both simultaneously.

29. C — Test the trailer connector under load with a test light or known load. Multimeter readings show open-circuit voltage but do not verify the connector can deliver current under load, where corroded or partial connections fail to supply rated current. A test light or known load verifies functional delivery.

30. A — High resistance in the tail light power feed or ground. Flickering with random intensity is the classic signature of intermittent high-resistance connections in the power or ground circuits, where contact resistance varies with vibration. Module failures typically produce on/off behavior; bulb failures produce no light at all.

31. D — Both Tech A and Tech B. LED retrofit installations may require load resistors because flashers depend on bulb current draw to time correctly, and reduced LED current causes hyper-flashing or no-flash conditions. LED tail lamps draw approximately 10 percent of equivalent incandescent current due to higher electrical efficiency.

32. A — Measure voltage drop on the dim headlight power feed and ground. A 1.6-volt difference between the dim and normal headlights indicates voltage drop in the dim side circuit, and measuring drop on power and ground sides isolates the resistance source. Component replacement before isolation is premature.

33. C — Inspect the seven-way connector and trailer pigtail for damage. All trailer marker lights inoperative with normal tractor lights points to a single-fault location at the trailer interface — typically the seven-way connector or trailer pigtail. This is the most accessible inspection point and the most common failure location.

34. B — Verify ground integrity at the lamp position. Continuity from switch to lamp confirms the power side is intact, so an inoperative lamp must have a ground-side fault preventing current flow. Ground verification is the next logical step before bulb or wiring replacement.

35. D — Verify J1939 data bus communication and integrity. With power and ground verified at the cluster, erratic gauge behavior on a multiplexed cluster traces to data bus communication issues

that cause the cluster to receive incorrect or incomplete sensor data. Bus integrity verification is the next step.

36. A — Verify scan tool connection and bus voltage at the diagnostic connector. The 60-ohm bus reading confirms the bus itself is electrically intact (terminating resistors functional), so the no-communication fault is more likely at the scan tool interface or diagnostic connector. Connection verification is the next step.

37. C — Verify temperature sender signal with a scan tool or multimeter. Red-zone gauge with verified normal engine temperature indicates the gauge is receiving an incorrect signal, and verifying the sender signal output identifies whether the sender is the cause. Component replacement before signal verification is premature.

38. B — Verify sensor signal voltage with a multimeter at the sensor connector. A coolant temperature sensor code requires verification of actual sensor signal voltage before sensor replacement, since wiring, ground, or supply faults can produce sensor codes without the sensor itself being defective. Verification confirms the failure point.

39. D — Both Tech A and Tech B. Fault codes must be retrieved before any component replacement to identify the specific system reporting the fault, and codes must be cleared after verified repair to confirm the issue is resolved (or to allow new codes to set if not). Both procedures are standard diagnostic practice.

40. C — One terminating resistor is open or missing. A measurement of 120 ohms between CAN-H and CAN-L (vs the expected 60 ohms) indicates only one terminating resistor remains in circuit, doubling the measured resistance. The other resistor is open or disconnected.

41. B — Verify primary power and ground connections at the battery and chassis. Multiple unrelated fault codes across different modules typically trace to a common power or ground fault affecting multiple modules simultaneously. Verification of primary connections is the cheapest and most likely first step.

42. D — Verify the engine ECU is broadcasting on the J1939 bus. The cluster receiving ABS data confirms the bus is functional, so the missing engine data points to the engine ECU not broadcasting on the bus. Verification with a scan tool determines whether the ECU is communicating before further diagnosis.

43. A — Both Tech A and Tech B. Intermittent communication faults commonly trace to bus wiring or connector issues that produce intermittent open or short conditions, and they can also trace to module power supply issues that cause the module to drop off the bus during voltage variations. Both causes are part of standard intermittent diagnosis.

44. C — Verify the low-air pressure switch signal with a scan tool or multimeter. A warning lamp with verified normal pressure indicates the switch is providing a false signal, and signal verification

confirms the switch is the cause before replacement. Component replacement without verification can leave the actual fault in place.

45. A — Verify speed sensor signal at the cluster input. A speedometer reading zero requires verification of the speed sensor signal at the cluster input to determine whether the failure is in the sensor, wiring, or cluster. Component replacement without signal verification is premature.

46. D — Cluster requires programming with truck-specific configuration. Modern heavy-duty instrument clusters require programming with truck-specific configuration data (mileage, VIN, options) after replacement, and missing programming produces incorrect mileage display. Plug-and-play installation does not complete the service on multiplexed trucks.

47. C — Both Tech A and Tech B. Scan tool live data shows real-time sensor and module values during operation, which is critical for diagnosing intermittent issues that do not produce stored fault codes. Both functions are core to modern heavy-duty truck diagnostics.

48. B — The warning system is performing a normal bulb-check function. Heavy-duty truck warning lamps perform a bulb-check function during start-up by illuminating briefly, then turning off when the system verifies normal operation. This is intentional design for verifying lamp integrity, not a fault condition.

49. D — Verify cellular signal strength and network registration. A telematics module not transmitting requires first verification of cellular signal strength and network registration, since most non-transmission complaints trace to signal availability rather than module failure. Component replacement before verification is wasteful.

50. A — Return the truck to service and monitor for code reappearance. Battery-replacement codes that clear normally after a scan tool clear command typically do not return because they were caused by voltage transients, not actual faults. Monitoring for code reappearance verifies the codes were transient, with further diagnosis only if codes return.