PRACTICE EXAM 11: A9 LIGHT VEHICLE DIESEL ENGINES SIMULATION (60 QUESTIONS)

1. A diesel makes a rhythmic knock that gets louder under load and is timed to engine speed, easing when one cylinder's injector is electrically disabled. This MOST likely indicates:

A. a glow plug that has failed open on that cylinder

B. a thermostat that is stuck in the open position

C. a worn connecting-rod bearing in that cylinder

D. a fuel/water separator overdue for draining

2. A technician needs to verify whether a diesel's exhaust system is restricted. The MOST direct test is to:

A. measure exhaust back-pressure with a gauge at a test port

B. read the boost pressure produced by the turbocharger at idle

C. check the engine oil pressure at operating temperature

D. inspect the diesel exhaust fluid level in its tank

3. A diesel's intake air filter is severely clogged. The MOST likely result is:

A. coolant contamination of the engine oil supply

B. excessively high common-rail fuel pressure at idle

C. continuous overcharging of the starting batteries

D. reduced airflow, low power, and possible black smoke

4. Technician A says a diesel ignites fuel using a spark plug timed to each cylinder. Technician B says a diesel ignites fuel by the heat of compression. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

5. On a common-rail diesel, the high-pressure pump is typically driven by the:

A. engine's gear or belt drive off the camshaft or crankshaft

B. electric motor built into the fuel tank assembly

C. exhaust gas spinning a small turbine wheel

D. high-pressure engine oil from the lubrication system

6. A diesel with an SCR system shows a fault for low DEF dosing, and the dosing injector is found clogged with crystallized deposits. The correct repair is to:

A. raise the commanded rail pressure inside the ECM

B. replace the full set of high-pressure fuel injectors

C. reprogram the injector calibration codes in the ECM

D. clean or replace the DEF dosing injector and clear the fault

7. During a cylinder leak-down test, air is heard bubbling up through the engine oil filler/breather. This indicates the leak is past the:

A. intake valve into the intake manifold

B. exhaust valve into the exhaust manifold

C. piston rings into the crankcase

D. head gasket into the cooling system

8. A diesel's camshaft position sensor signal is intermittently lost. The MOST likely symptom is:

A. coolant leaking into the engine oil supply

B. overcharging of the vehicle's starting batteries

C. hard starting, stalling, or a no-start condition

D. a permanently plugged diesel particulate filter

9. The MOST accurate way to measure a cylinder bore for wear is with a:

A. feeler gauge inserted along the cylinder wall

B. dial bore gauge taking readings at several depths

C. straightedge laid across the block deck surface

D. plastic gauging strip crushed against the wall

10. A diesel's coolant is dark, rusty, and contains debris, and the heater core is partially plugged. The technician should:

A. add a bottle of cooling-system stop-leak and retest

B. flush the system and refill with the correct coolant

C. raise the radiator cap pressure rating to compensate

D. replace the thermostat with one of a higher rating

11. A diesel injector's return (leak-off) line carries fuel that:

A. leaks past internal clearances and returns to the tank

B. is pressurized to actuate the variable-geometry turbo

C. cools the diesel exhaust fluid before it is dosed

D. supplies the glow plugs during the warm-up period

12. A diesel runs rough and lacks power, and scan data shows actual rail pressure far below the commanded value at all loads with normal lift-pump supply. The MOST likely cause is:

A. a clogged engine air filter restricting airflow

B. a thermostat stuck in the wide-open position

C. an EGR valve stuck in the closed position

D. a worn high-pressure pump or a leaking pressure control valve

13. A turbocharger's purpose on a diesel engine is to:

A. cool the exhaust gas before it reaches the catalyst

B. filter soot out of the exhaust before the tailpipe

C. recirculate exhaust into the intake to lower NOx

D. force more air into the cylinders to increase power

14. A diesel's oil analysis shows a high level of coolant (glycol) in the oil. A likely internal source is a:

A. fuel injector dribbling raw fuel into a cylinder

B. worn set of rings allowing combustion blow-by

C. failed oil cooler or a cracked block or head

D. clogged air filter restricting intake airflow

15. A diesel particulate filter that has reached its ash limit and can no longer be regenerated effectively must be:

A. replaced with a larger diesel oxidation catalyst

B. left in service since ash burns off during driving

C. flushed with diesel exhaust fluid to dissolve the ash

D. removed and professionally cleaned or replaced

16. A diesel's serpentine belt tensioner has lost spring tension. The MOST likely result is:

A. belt slippage causing poor charging and accessory drive

B. coolant contamination of the engine oil supply

C. excessively high common-rail fuel pressure at idle

D. a no-crank condition at the starter motor circuit

17. Valve lash that is set too loose on a mechanical-lifter diesel will MOST likely cause:

A. valves held off their seats and burned valve faces

B. coolant leaking into the combustion chamber

C. valve-train noise and reduced valve lift and duration

D. excessively high common-rail fuel pressure at idle

18. A diesel uses a wastegated, fixed-geometry turbocharger. The wastegate is controlled to:

A. recirculate exhaust gas back into the intake manifold

B. limit maximum boost by bypassing exhaust around the turbine

C. cool the compressed intake air after the compressor

D. inject diesel exhaust fluid ahead of the SCR catalyst

19. The "wait-to-start" lamp on a diesel signals the driver to wait while the:

A. glow plugs heat the combustion chambers for starting

B. high-pressure pump primes the common fuel rail

C. diesel particulate filter completes a regeneration

D. diesel exhaust fluid tank is heated and thawed

20. A diesel's engine oil is changed but the wrong viscosity is installed, much thinner than specified. The MOST likely result is:

A. coolant contamination of the engine oil supply

B. lower oil pressure and reduced film strength under load

C. a stuck-open exhaust gas recirculation valve

D. a permanently plugged diesel particulate filter

21. A fuel-supply (lift) pump on a diesel is responsible for:

A. building the final high pressure delivered to the injectors

B. metering the exact fuel quantity injected each cycle

C. drawing fuel from the tank and feeding the high-pressure pump

D. returning excess fuel from the rail back to the tank

22. A diesel's exhaust shows heavy black smoke under hard acceleration but runs clean at light load. The MOST likely cause is:

A. coolant leaking into a cylinder through the head gasket

B. over-fueling or insufficient air during heavy demand

C. engine oil drawn past worn valve guide seals

D. normal cold-start behavior before the engine warms

23. To check crankshaft main-bearing journal taper, the technician measures the journal diameter at:

A. both ends of the journal and compares the two readings

B. several points around the journal at one location

C. the parting line of the bearing insert only

D. the crankshaft snout with a dial indicator

24. A diesel's glow plug control module commands the plugs based partly on:

A. the diesel exhaust fluid concentration in the tank

B. the boost pressure produced by the turbocharger

C. the exhaust back-pressure across the particulate filter

D. the engine coolant temperature at start-up

25. A diesel's charge-air cooler develops an external leak in its core. The MOST likely result is:

A. coolant loss and a steadily overheating engine

B. overcharging of the vehicle's starting batteries

C. a no-crank condition at the starter solenoid

D. boost loss, reduced power, and possible black smoke

26. A common-rail diesel stores a fault that one injector's response time is out of range, and that cylinder misfires. The correct repair is to:

A. test and replace the affected injector as indicated

B. raise the commanded rail pressure inside the ECM

C. command a forced diesel particulate filter regen

D. flush the cooling system and replace the coolant

27. Selective catalytic reduction lowers NOx by:

A. trapping nitrogen oxides in the particulate filter

B. recirculating exhaust gas back into the intake charge

C. reacting NOx with ammonia from DEF over a catalyst

D. oxidizing nitrogen oxides in the oxidation catalyst

28. A diesel's exhaust gas recirculation valve is commanded open but the position feedback shows it is not moving. The technician should suspect the:

A. diesel exhaust fluid quality sensor in the tank

B. EGR valve being seized or its actuator and circuit faulty

C. high-pressure fuel pump worn beyond specification

D. thermostat stuck in the wide-open position

29. A diesel cooling fan driven by a viscous clutch roars constantly even when the engine is cold. The MOST likely cause is a:

A. thermostat stuck in the closed position

B. fan clutch locked up and engaged at all times

C. water pump leaking from its weep hole

D. radiator clogged with external road debris

30. On many diesels, the boost (manifold absolute pressure) sensor's signal is compared by the ECM against the:

A. commanded (desired) boost target for that condition

B. diesel exhaust fluid dosing quantity at that load

C. battery charging voltage at the alternator output

D. coolant temperature target for the warm-up period

31. A diesel uses oil-cooled piston cooling jets. If these jets become blocked, the MOST likely consequence is:

A. coolant contamination of the engine oil supply

B. continuous overcharging of the starting batteries

C. piston overheating and possible scuffing or damage

D. a no-crank condition at the starter motor circuit

32. A diesel's fuel returns warm and the rail struggles to hold pressure on a long, hot climb. A contributing factor can be a:

A. thermostat stuck in the closed position

B. clogged or failed fuel cooler raising fuel temperature

C. glow plug control module that has failed open

D. cabin HVAC blower drawing excessive current

33. A multilayer steel head gasket is being installed on a diesel. The deck surfaces of the head and block must be:

A. coated heavily with RTV sealant on both sides

B. roughened with an abrasive disc for better grip

C. left with the old gasket material partly in place

D. clean, flat, and within the specified surface finish

34. A diesel runs hot, the coolant level is correct, and the system holds pressure, but the lower radiator hose collapses at high rpm. The MOST likely cause is a:

A. thermostat that is stuck in the open position

B. failed lower-hose internal spring or a restriction

C. head gasket leaking combustion gas into coolant

D. water pump impeller loose on its drive shaft

35. A diesel injector is described as "electronically controlled." This means the injection event is governed by:

A. a mechanical governor linked to the throttle pedal

B. fuel pressure alone opening the nozzle at a set point

C. an electrical signal from the ECM to the injector

D. exhaust back-pressure acting on a control diaphragm

36. A diesel's lift pump runs but delivers low volume, and the engine loses power at high fuel demand while idling fine. The MOST likely cause is a:

A. thermostat stuck in the wide-open position

B. clogged radiator restricting coolant flow at load

C. glow plug control module that has failed open

D. weak or worn lift pump or a restricted supply line

37. A diesel's EGR system has become heavily fouled with soot, sticking the valve. A common contributing factor is:

A. frequent short trips that prevent full warm-up and cleaning

B. the use of ultra-low-sulfur diesel in the engine

C. the high pressure of the common-rail injection system

D. a thermostat that opens at too high a temperature

38. A diesel's connecting-rod side clearance is measured with a feeler gauge:

A. between the piston ring and its ring-land groove

B. between the rod's big end and the crankshaft cheek

C. across the deck surface of the cylinder head

D. between the valve stem tip and the rocker arm

39. A diesel emits blue smoke that increases under load and the oil level drops over time. The MOST likely cause is:

A. a head gasket leaking coolant into a cylinder

B. a fuel injector dribbling raw fuel into a cylinder

C. normal cold-start behavior before the engine warms

D. worn rings, valve guides, or turbo seals burning oil

40. A diesel particulate filter's job in the exhaust system is to:

A. convert oxides of nitrogen into nitrogen and water

B. oxidize carbon monoxide and hydrocarbons into safer gases

C. physically trap soot particles from the exhaust stream

D. meter diesel exhaust fluid into the exhaust ahead of the SCR

41. A diesel's high-pressure fuel system is being serviced. Before loosening any high-pressure line, the technician must:

A. raise the engine to full operating temperature first

B. top off the diesel exhaust fluid tank to full

C. command a forced particulate filter regeneration

D. relieve the residual pressure and let the rail bleed down

42. A diesel's NOx sensor downstream of the SCR catalyst reads nearly the same NOx as the upstream sensor. This indicates:

A. the particulate filter is loaded with excess soot

B. the turbocharger is producing too little boost

C. the glow plugs are failing to heat on cold starts

D. the catalyst is not reducing NOx as it should

43. A diesel valve that has been refaced so many times that its margin is nearly gone must be:

A. replaced rather than ground any thinner

B. installed with a thicker valve stem seal

C. paired with a stiffer replacement spring

D. reused with added valve guide clearance

44. A diesel is hard to start when cold and produces gray-white smoke during extended cranking, and several glow plugs test open. The correct repair is to:

A. raise the commanded rail pressure inside the ECM

B. replace the high-pressure fuel pump assembly

C. replace the failed glow plugs and test the controller

D. reprogram the injector calibration codes in the ECM

45. A diesel's coolant is overdue for change in a wet-liner engine, and the additive package is depleted. The liners are at risk of:

A. external rust forming on the exhaust manifold

B. an overadvanced fuel injection timing condition

C. cavitation erosion and pitting on the coolant side

D. a stuck variable-geometry turbocharger actuator

46. A diesel injector's calibration (trim) code is printed on the injector body so that, after replacement, the technician can:

A. count the total injection events the injector performs

B. enter the code so the ECM compensates for its flow

C. measure the temperature of the returning fuel

D. disable the cylinder if the injector fails completely

47. A diesel uses a thermostat to:

A. limit the maximum boost the turbocharger can build

B. meter the diesel exhaust fluid into the SCR catalyst

C. regulate coolant flow to maintain operating temperature

D. control the high pressure delivered to the fuel rail

48. A diesel's exhaust temperature sensor reads implausibly high during a regeneration, and the data does not match the others. The technician should FIRST:

A. replace the diesel particulate filter assembly

B. raise the commanded rail pressure inside the ECM

C. command another forced regeneration immediately

D. test the sensor and its circuit before condemning parts

49. A diesel's intake manifold pressure (boost) rises normally, but the engine still lacks power and exhaust temperature is high. A logical next check is the:

A. exhaust system for a restriction such as a plugged DPF

B. battery state of charge and the cable connections

C. cabin HVAC blower motor and its control circuit

D. diesel exhaust fluid level in its storage tank

50. A diesel's fuel/water separator is equipped with a water-in-fuel sensor that:

A. measures the cetane number of the incoming fuel

B. controls the high pressure delivered to the rail

C. warns the driver when water must be drained

D. meters diesel exhaust fluid into the exhaust stream

51. A diesel's cooling system is being refilled after service. Failing to properly bleed trapped air will MOST likely cause:

A. excessively high common-rail fuel pressure at idle

B. continuous overcharging of the starting batteries

C. a no-crank condition at the starter motor circuit

D. localized overheating and erratic temperature readings

52. A diesel oil pump that is worn and unable to maintain pressure will MOST likely cause:

A. low oil pressure and accelerated bearing wear

B. coolant contamination of the engine oil supply

C. excessively high common-rail fuel pressure

D. a stuck-open exhaust gas recirculation valve

53. Technician A says higher-cetane fuel resists ignition like high-octane gasoline. Technician B says higher-cetane fuel ignites more readily with a shorter delay. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

54. A diesel's variable-geometry turbocharger vanes are commanded to a position but the boost does not respond, and the vanes are found seized with carbon. The correct repair is to:

A. raise the commanded boost target inside the ECM

B. clean or replace the turbo so the vanes move freely

C. install a larger charge-air cooler to lower temperatures

D. reprogram the injector calibration codes in the ECM

55. A diesel's compression is low across all cylinders, and the engine cranks fast and is hard to start. A likely cause affecting all cylinders is:

A. general ring and cylinder wear from high mileage

B. a single burned exhaust valve in one cylinder

C. a cracked head between two specific cylinders

D. one injector dribbling fuel into its cylinder

56. A diesel's coolant temperature gauge reads low and the engine never reaches full operating temperature, hurting fuel economy. The MOST likely cause is a:

A. radiator clogged with external road debris

B. water pump impeller loose on its drive shaft

C. thermostat stuck in the open position

D. head gasket leaking combustion gas into coolant

57. A diesel's high-pressure common rail is fitted with a pressure relief valve that:

A. meters the exact fuel quantity injected each cycle

B. draws fuel from the tank to feed the high-pressure pump

C. cools the fuel returning to the tank from the injectors

D. opens to protect the system if rail pressure goes too high

58. A diesel's piston shows a hole melted through its crown. A likely cause is:

A. coolant leaking past the head gasket into the cylinder

B. excessive combustion heat from a faulty over-fueling injector

C. a thermostat that is stuck in the open position

D. air drawn into the fuel on the suction side of the pump

59. A diesel's oil pressure warning light comes on at idle but goes out at higher rpm. Before condemning the oil pump, the technician should FIRST check the:

A. engine oil level, condition, and correct viscosity

B. cylinder compression on each individual cylinder

C. camshaft lobe lift against the service specification

D. charge-air cooler for an internal coolant leak

60. A diesel's exhaust aftertreatment includes a DOC, a DPF, and an SCR catalyst. The correct order of these components from the engine outward is typically:

A. diesel oxidation catalyst, particulate filter, then SCR catalyst

B. SCR catalyst, particulate filter, then oxidation catalyst

C. particulate filter, SCR catalyst, then oxidation catalyst

D. SCR catalyst, oxidation catalyst, then particulate filter

PRACTICE EXAM 11 — ANSWER KEY (Questions 1–60)

1. C — A load-sensitive knock timed to engine speed that eases when that cylinder's injector is cut signals a worn connecting-rod bearing, since removing the combustion load on that rod quiets the noise. Glow plug, thermostat, and separator faults do not produce a load-timed knock. The cylinder-cutout response isolates the bad bearing.

2. A — Exhaust restriction is confirmed most directly by measuring back-pressure with a gauge at a test port, which reads the actual resistance in the system. Boost, oil pressure, and DEF level do not measure exhaust restriction. A back-pressure reading above spec points to a plugged DPF or collapsed pipe.

3. D — A severely clogged air filter starves the engine of air, causing reduced airflow, low power, and black smoke from the rich condition. It does not contaminate oil, raise fuel pressure, or overcharge batteries. Replacing the filter restores airflow and clean combustion.

4. B — Technician B is correct: a diesel ignites fuel by the heat of compression, not a spark. Technician A is wrong because diesels have no spark plugs firing each cylinder. Compression ignition is the defining principle of diesel operation.

5. A — On common-rail diesels the high-pressure pump is mechanically driven by the engine through a gear or belt off the camshaft or crankshaft. It is not an in-tank electric pump, exhaust-driven, or oil-actuated. Engine drive provides the energy to generate rail pressure.

6. D — A DEF dosing injector clogged with crystallized deposits cannot meter fluid, so it must be cleaned or replaced and the fault cleared. Rail pressure, fuel injectors, and calibration codes are unrelated to DEF dosing. Restoring the dosing injector returns proper SCR operation.

7. C — Air bubbling out the oil filler or breather during a leak-down test shows the pressure is escaping past the piston rings into the crankcase. Valve leaks vent through the intake or exhaust, and gasket leaks bubble into the coolant. The breather location confirms worn rings.

8. C — An intermittently lost camshaft position signal disrupts the ECM's timing and synchronization, producing hard starting, stalling, or a no-start. It does not introduce coolant, overcharge batteries, or plug the DPF. Repairing the sensor circuit restores reliable starting.

9. B — Cylinder bore wear is most accurately measured with a dial bore gauge taking readings at several depths, revealing taper and out-of-round. Feeler gauges, straightedges, and gauging strips cannot measure bore diameter precisely. Accurate readings determine whether the bore needs machining.

10. B — Dark, rusty, debris-laden coolant with a plugged heater core calls for flushing the system and refilling with the correct coolant to remove contamination. Stop-leak, a higher-pressure cap, or a different thermostat would not clean the system. A proper flush restores cooling and additive protection.

11. A — The injector return (leak-off) line carries fuel that leaks past internal injector clearances back to the tank, and its volume is a useful diagnostic. It does not actuate the turbo, cool DEF, or feed glow plugs. Comparing return volumes helps identify a leaking injector.

12. D — Rail pressure far below command at all loads, with normal lift-pump supply, points to a worn high-pressure pump or a leaking pressure control valve that cannot build or hold pressure. Air filter, thermostat, and EGR faults would not collapse rail pressure. The pressure-side components must be tested.

13. D — A turbocharger forces more air into the cylinders, allowing more fuel to be burned for greater power. It does not cool exhaust, trap soot, or recirculate exhaust. Increased air density is the source of the power gain.

14. C — Glycol (coolant) found in the oil comes from an internal leak such as a failed oil cooler or a cracked block or head letting coolant into the oil galleries. Injector dribble, blow-by, and a dirty filter do not introduce glycol. Finding the coolant path is essential before bearing damage occurs.

15. D — A DPF at its ash limit cannot be regenerated because ash does not burn, so it must be removed and professionally cleaned or replaced. Substituting a DOC, leaving it in service, or flushing with DEF will not remove ash. Ash-cleaning service restores filter flow.

16. A — A tensioner that has lost spring force allows the serpentine belt to slip, degrading charging and accessory drive. It does not contaminate oil, raise fuel pressure, or prevent cranking. Replacing the tensioner restores firm belt tension and accessory operation.

17. C — Valve lash set too loose creates valve-train noise and reduces effective valve lift and duration because part of the cam motion is lost to the gap. Lash that is too tight instead burns valves. Correct lash restores quiet operation and full valve opening.

18. B — On a wastegated fixed-geometry turbo, the wastegate limits maximum boost by bypassing some exhaust around the turbine so it does not overspeed. It does not recirculate exhaust, cool intake air, or dose DEF. The bypass caps peak boost to protect the engine.

19. A — The wait-to-start lamp tells the driver to wait while the glow plugs heat the combustion chambers so the cold engine will start and run smoothly. It is not tied to rail priming, regeneration, or DEF thawing. Waiting for the lamp ensures adequate preheat.

20. B — Oil that is much thinner than specified produces lower oil pressure and a weaker film, especially under load, accelerating wear. It does not introduce coolant, stick the EGR valve, or plug the DPF. Installing the correct viscosity restores proper pressure and protection.

21. C — The lift (supply) pump draws fuel from the tank and feeds it to the high-pressure pump at low pressure. It does not build injection pressure, meter quantity, or handle the return. Adequate lift-pump supply is required for the high-pressure pump to work.

22. B — Black smoke only under hard acceleration indicates over-fueling or insufficient air when demand is high, leaving unburned carbon. Coolant, oil, and cold-start causes produce different smoke and timing. Correcting the air-fuel balance under load clears the smoke.

23. A — Journal taper is found by measuring the diameter at both ends of the journal and comparing them, since taper is a lengthwise change in diameter. Measuring around the journal reveals out-of-round instead. The end-to-end difference determines whether the journal needs regrinding.

24. D — The glow plug control module bases its energizing time partly on engine coolant temperature at start-up, applying more preheat when colder. DEF concentration, boost, and exhaust back-pressure are not used for this. Temperature-based control tailors preheat to starting conditions.

25. D — An external charge-air cooler leak lets boost escape, causing boost loss, reduced power, and possible black smoke from the air shortage. It does not lose coolant, overcharge batteries, or prevent cranking. Repairing the cooler restores boost and power.

26. A — A single injector with an out-of-range response time and a misfire on its cylinder should be tested and replaced as indicated. Raising rail pressure, forcing a regen, or flushing coolant would not address the faulty injector. Replacing it restores smooth firing on that cylinder.

27. C — Selective catalytic reduction lowers NOx by reacting it with ammonia, derived from DEF, over the SCR catalyst to form nitrogen and water. It does not trap NOx in the DPF, recirculate exhaust, or oxidize NOx in the DOC. The ammonia reaction is the core of SCR.

28. B — When the EGR valve is commanded open but does not move, the valve is likely seized or its actuator and circuit are faulty. DEF quality, the fuel pump, and the thermostat are unrelated to EGR position. Testing the valve and its actuator isolates the fault.

29. B — A viscous fan clutch that roars constantly even when cold has locked up and is engaged at all times, instead of freewheeling until hot. A thermostat, water pump, or radiator fault would not cause constant fan engagement. Replacing the clutch restores normal, temperature-based operation.

30. A — The ECM compares the boost (MAP) sensor's actual reading against the commanded boost target to judge whether the turbo is meeting demand. DEF dosing, charging voltage, and coolant targets are unrelated comparisons. This comparison drives boost control and fault detection.

31. C — Blocked piston cooling jets stop spraying oil on the piston undersides, allowing piston overheating and possible scuffing or damage. They do not contaminate oil with coolant, overcharge batteries, or prevent cranking. Clear jets are essential to controlling piston temperature.

32. B — Warm return fuel and a rail that struggles to hold pressure on a hot climb can stem from a clogged or failed fuel cooler that lets fuel temperature climb. A thermostat, glow plug module, or HVAC blower would not raise fuel temperature. Restoring the fuel cooler stabilizes pressure under heat.

33. D — A multilayer steel head gasket requires deck surfaces that are clean, flat, and within the specified surface finish to seal properly. Heavy RTV, deliberate roughening, or leftover gasket material would prevent sealing. Proper surface prep is critical to MLS gasket performance.

34. B — A lower radiator hose that collapses at high rpm usually has a failed internal support spring or a restriction, since suction from the pump pulls the weakened hose flat. A thermostat, gasket, or pump fault would not collapse the hose this way. Replacing the hose restores coolant flow.

35. C — An electronically controlled injector is governed by an electrical signal from the ECM, which sets injection timing and quantity precisely. It is not run by a mechanical governor, pressure alone, or exhaust back-pressure. ECM control enables modern multiple-injection strategies.

36. D — A lift pump delivering low volume cannot keep up at high fuel demand, so the engine idles fine but loses power under load; the cause is a weak pump or restricted supply line. Thermostat, radiator, and glow plug faults would not be fuel-demand-dependent. Restoring supply volume returns full power.

37. A — Frequent short trips keep the engine and exhaust from fully warming, so the EGR system fouls with soot and the valve sticks. ULSD, rail pressure, and thermostat rating are not the cause. Longer drives and cleaning reduce the soot buildup.

38. B — Connecting-rod side clearance is measured with a feeler gauge between the rod's big end and the crankshaft cheek. The ring groove, head deck, and rocker gap are unrelated measurements. Correct side clearance ensures proper oil flow and rod movement.

39. D — Blue smoke that increases under load with a dropping oil level indicates oil is being burned past worn rings, valve guides, or turbo seals. Coolant or fuel intrusion and cold-start behavior produce different symptoms. Locating the oil path guides the repair.

40. C — The diesel particulate filter physically traps soot particles from the exhaust stream so they are not released to the air. It does not reduce NOx, oxidize CO and HC, or dose DEF. Trapping soot for later regeneration is its function.

41. D — Before loosening any high-pressure fuel line, the technician must relieve the residual pressure and let the rail bleed down to avoid high-pressure fuel injection injury. Temperature, DEF level, and regeneration are irrelevant to this hazard. Proper bleed-down makes the service safe.

42. D — When the downstream NOx sensor reads nearly the same as the upstream sensor, the SCR catalyst is not reducing NOx as it should. Soot load, low boost, and glow plug faults would not show as equal NOx readings. The matched readings reveal poor catalyst conversion.

43. A — A valve refaced until almost no margin remains must be replaced, because grinding it thinner leaves too little material and it will overheat and burn. Seals, springs, and guide clearance cannot restore lost margin. Replacement protects against valve failure.

44. C — Hard cold starting with gray-white smoke and several glow plugs testing open is corrected by replacing the failed plugs and testing the controller. Rail pressure, the fuel pump, and calibration codes are not the cause of failed glow plugs. Restoring preheat fixes the cold-start problem.

45. C — Depleted coolant additives in a wet-liner engine leave the liners exposed to cavitation erosion and pitting on the coolant side. Manifold rust, injection timing, and the turbo actuator are unrelated to liner cavitation. Maintaining additive levels protects the liners.

46. B — The calibration (trim) code printed on a new injector is entered into the ECM so it can compensate for that injector's exact flow and balance fueling. It is not for counting events, reading return temperature, or disabling cylinders. Entering the code keeps the engine running smoothly.

47. C — A thermostat regulates coolant flow to maintain the engine's operating temperature, blocking flow until the engine warms. It does not limit boost, meter DEF, or control rail pressure. Proper thermostat operation keeps the engine at its designed temperature.

48. D — An exhaust temperature sensor reading implausibly high and out of step with the others should first be tested along with its circuit before condemning costly parts. Replacing the DPF, raising rail pressure, or forcing another regen would be premature. Verifying the sensor avoids unnecessary replacement.

49. A — Normal boost with low power and high exhaust temperature points to an exhaust restriction such as a plugged DPF, which should be checked next. Battery, HVAC, and DEF level would not produce this combination. Measuring back-pressure confirms the restriction.

50. C — The water-in-fuel sensor in the separator warns the driver when accumulated water must be drained to protect the injection system. It does not measure cetane, control rail pressure, or dose DEF. Responding to the warning prevents water-induced corrosion.

51. D — Air left in the cooling system after refilling creates hot spots and erratic temperature readings because air does not transfer heat or surround the sensor consistently. It does not raise fuel pressure, overcharge batteries, or prevent cranking. Proper bleeding restores accurate, even cooling.

52. A — A worn oil pump that cannot maintain pressure produces low oil pressure and accelerated bearing wear from inadequate lubrication. It does not introduce coolant, raise fuel pressure, or stick the EGR valve. Replacing the pump restores proper oil pressure.

53. B — Technician B is correct: higher-cetane fuel ignites more readily with a shorter ignition delay. Technician A is wrong because cetane is the opposite of octane's ignition resistance. Higher cetane improves cold starting and smooths combustion.

54. B — VGT vanes seized with carbon cannot respond to commands, so the turbo must be cleaned or replaced to free the vanes. Raising boost targets, fitting a larger cooler, or reprogramming injectors would not free them. Restoring vane movement returns normal boost control.

55. A — Low compression across all cylinders with fast cranking and hard starting indicates general ring and cylinder wear from high mileage. A single burned valve, a localized head crack, or one bad injector would affect only specific cylinders. Uniform low compression points to overall engine wear.

56. C — A thermostat stuck open lets coolant circulate continuously, so the engine never reaches full operating temperature and fuel economy suffers. A clogged radiator or loose pump would tend to overheat. Replacing the thermostat restores proper warm-up.

57. D — The common-rail pressure relief valve opens to protect the system if rail pressure rises too high, venting fuel to return. It does not meter injection, supply the pump, or cool return fuel. The relief valve is a safety device against overpressure.

58. B — A hole melted through a piston crown results from excessive combustion heat, often from a faulty injector over-fueling that cylinder. Coolant intrusion, a stuck-open thermostat, or suction-side air would not melt the crown. Correcting the over-fueling prevents repeat piston damage.

59. A — Before condemning the oil pump for low idle pressure, the technician should first verify the oil level, condition, and viscosity, since these cheaply explain low pressure. Compression, lobe lift, and the charge-air cooler are unrelated to oil pressure. Checking the basics first avoids an unneeded pump job.

60. A — In a typical light-vehicle diesel aftertreatment layout, exhaust flows through the diesel oxidation catalyst first, then the particulate filter, then the SCR catalyst. The DOC generates heat and oxidizes CO and HC, the DPF traps soot, and the SCR reduces NOx last. This order matches how each stage conditions the gas for the next.