PRACTICE EXAM 11: ASE G1 SIMULATION — 55 QUESTIONS

1. A light-duty diesel vehicle has hard starting in cold weather. The glow plug indicator light on the dashboard illuminates briefly and then goes out. The engine eventually starts after extended cranking. Which of the following is the MOST likely cause?

A. The fuel filter is clogged with paraffin wax that forms in diesel fuel at low temperatures

B. The diesel injection pump timing is retarded

C. One or more glow plugs have failed, providing insufficient pre-heat to the combustion chambers for reliable cold ignition

D. The engine oil is too thick for cold-weather operation, creating excessive cranking resistance

2. A technician has replaced a brake master cylinder. Before installing it on the vehicle, the technician must perform a specific procedure to prevent air from being trapped in the master cylinder during installation. Which procedure is this?

A. Bench bleeding — clamping the master cylinder in a vise, filling the reservoir, and cycling the piston with the ports plugged or looped back to the reservoir until no air bubbles appear in the fluid

B. Gravity bleeding the entire brake system with the new master cylinder installed on the vehicle

C. Pressure bleeding the master cylinder using the vehicle's power brake booster vacuum

D. Filling the reservoir and allowing the fluid to gravity-feed through the cylinder overnight

3. A customer brings a vehicle in for a noise complaint. The technician hears a rhythmic thumping from the front that occurs once per wheel revolution at all speeds. The noise does not change with braking or steering input. Which of the following is the MOST likely cause?

A. A worn front wheel bearing producing a cyclic vibration

B. A flat spot on a tire from skidding or prolonged stationary storage, or an object (stone, nail head) embedded in the tread that contacts the road once per revolution

C. A warped brake rotor contacting the pad once per revolution

D. A loose wheel bearing nut allowing the hub to shift once per rotation

4. A vehicle's scan tool shows three DTCs: a pending P0302, a confirmed (current) P0171, and a permanent P0420. Which of the following correctly describes the significance of each code status?

A. All three codes are equally urgent and require immediate repair

B. The pending code is the oldest and most critical, the confirmed code is informational, and the permanent code will clear itself

C. The permanent code can be cleared with a scan tool, the pending code will set the MIL, and the confirmed code is the only one requiring diagnosis

D. The pending code (P0302) has been detected but has not yet completed enough fault cycles to illuminate the MIL; the confirmed code (P0171) has met the criteria to illuminate the MIL; the permanent code (P0420) has been stored in protected memory and cannot be cleared with a scan tool — it can only be removed by the PCM after the repair is verified through a successful drive cycle

5. Technician A says that an alternator with an overrunning alternator decoupler (OAD) pulley should have the pulley tested for proper one-way clutch operation during any belt noise diagnosis. Technician B says the OAD pulley is a solid pulley that spins at the same speed as the alternator shaft at all times. Who is correct?

A. Technician A only — the OAD pulley contains a one-way clutch that allows the alternator to freewheel momentarily during rapid engine deceleration, reducing belt slip and noise; when the clutch fails, the pulley locks up or freewheels in both directions, causing belt chirp, squeal, or premature belt wear

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

6. A vehicle has a vibration at highway speed that was not present before a driveshaft universal joint was replaced. The vibration is felt through the floorboard and increases with speed. Which of the following is the MOST likely cause?

A. The replacement U-joint is defective and has a tight bearing cap

B. The driveshaft was installed 180 degrees out of phase from its original orientation

C. The driveshaft was reinstalled out of its original index (clocking) position on the companion flange — driveshaft balance is matched to a specific orientation, and rotating it to a different bolt position changes the balance

D. The new U-joint is a different size than the original

7. A customer's vehicle has a clunking sound from the steering column when turning the steering wheel from left to right at a standstill. The clunk is felt through the steering wheel itself. All steering linkage and suspension components are tight. Which of the following is the MOST likely cause?

A. A failing power steering pump that cavitates during full-lock turns

B. A worn steering column intermediate shaft universal joint or coupling that has developed play

C. A loose steering wheel mounting nut

D. A worn rack-and-pinion mounting bushing

8. A technician is replacing brake pads on a vehicle equipped with an integrated electronic parking brake caliper on the rear. The scan tool commands the caliper pistons to retract, but only the left rear responds. The right rear piston does not move. Which of the following should the technician check FIRST?

A. The ABS hydraulic control module for an internal blockage

B. The wiring connector at the right rear EPB motor for power, ground, and proper connection — a disconnected or corroded connector prevents the motor from receiving the retract command

C. The brake fluid level, which may be too low to allow the pistons to retract

D. The parking brake switch on the center console for a fault signal

9. A vehicle's engine has a tapping noise that is loudest at the front of the engine near the timing cover. The noise increases with engine RPM and is present hot or cold. Which of the following is the MOST likely cause?

A. A collapsed hydraulic lifter on the rear cylinder bank

B. A worn main bearing at the rear of the crankshaft

C. A stuck-open PCV valve creating a vacuum leak at the valve cover

D. A loose or worn timing chain and/or worn timing chain tensioner or guides — chain slack allows the chain to whip and slap against the inside of the timing cover, producing a tapping or rattling noise that tracks with engine speed

10. A customer brings a vehicle in for an oil change. The technician checks the air filter during the multi-point inspection and finds it is dirty but not completely clogged. The owner's manual states the air filter replacement interval is every 30,000 miles. The vehicle has 22,000 miles since the last filter replacement. What is the correct recommendation?

A. Replace the filter based on its CONDITION rather than mileage alone — replacement intervals are guidelines; if the filter is visibly dirty, especially in dusty or urban driving conditions, it should be replaced regardless of mileage

B. The filter should not be replaced until the manufacturer's mileage interval is reached

C. Blow the filter clean with compressed air from the inside out and reinstall it

D. The filter only needs replacement if the check engine light illuminates with a MAF-related code

11. A vehicle equipped with four-wheel independent suspension has a DTC C0040 (Right Front Wheel Speed Sensor). The ABS, traction control, and stability control lights are all illuminated. The technician inspects the sensor and finds no visible damage or contamination. The wiring and connector appear intact. Which of the following should the technician check NEXT?

A. The sensor's resistance and compare it to the specification for the sensor type (passive or active)

B. The brake pads on the right front for excessive wear

C. The air gap between the sensor and the tone ring using a feeler gauge, and inspect the tone ring for cracked, missing, or damaged teeth — a tone ring defect produces the same symptom as a sensor failure

D. The ABS module for an internal circuit board fault

12. A vehicle's engine has been running hot. The technician squeezes the upper radiator hose when the engine is at operating temperature and the hose feels rock-hard with no give. Which of the following does this indicate?

A. The radiator hose is new and has not yet softened to its normal flexibility

B. The hose is within normal operating condition since it should be firm when hot

C. The radiator cap is venting pressure prematurely, causing the hose to collapse

D. The cooling system is building excessive pressure — this may indicate a stuck-closed radiator cap that cannot relieve pressure at its rated value, a combustion gas leak pressurizing the system beyond its design limits, or a blocked overflow path

13. A vehicle's front brake rotors were machined (turned) on a bench lathe during a brake service. After reinstallation, the brakes pulsate. Before the machining, there was no pulsation. Which of the following is the MOST likely cause?

A. The rotors were not machined to a proper surface finish, or they developed lateral runout due to contamination between the rotor and hub during reinstallation — the same hub-surface cleanliness that matters for new rotors matters equally for machined rotors

B. The brake lathe was defective and cut the rotors unevenly

C. The machined rotors are now too thin and are flexing under braking pressure

D. The brake pads were contaminated with cutting oil from the lathe

14. A vehicle's coolant has been tested with pH test strips and the result shows a pH of 7.0 (neutral). The coolant specification calls for a pH between 8.0 and 11.0. Which of the following is correct?

A. A pH of 7.0 is ideal because neutral coolant is less corrosive than alkaline coolant

B. The test strips are inaccurate for automotive coolant and should not be used

C. The coolant has become acidic relative to its design specification — the corrosion inhibitors are depleted and the coolant should be replaced to prevent internal corrosion of the radiator, heater core, water pump, and engine passages

D. Coolant pH does not affect cooling system component life

15. A customer asks why the vehicle's oil change interval has changed from 3,000 miles to 7,500 miles or more on newer vehicles. Which of the following is the MOST accurate explanation?

A. Oil change intervals remain at 3,000 miles for all engines regardless of oil type or technology

B. Longer intervals are only recommended for vehicles with synthetic oil and have no basis in engineering data

C. Modern vehicles use lower-quality oil that lasts longer due to fewer active additives

D. Modern engine oils have improved additive packages and base stocks, tighter engine manufacturing tolerances reduce contamination, and oil life monitoring systems track actual operating conditions to determine when the oil's protective capacity is depleted — the combination allows safe extended intervals

16. A vehicle's steering feels loose and has excessive play in the center position before the front wheels begin to turn. The ball joints and tie rod ends are tight with no measurable play. Which of the following is the MOST likely cause?

A. Worn front strut upper mounts allowing the strut to shift in its seat

B. Excessive play in the steering gear (rack and pinion or recirculating ball) caused by a worn rack bearing, loose adjustment, or internal gear wear

C. A bent front sway bar creating steering geometry changes

D. Worn front wheel bearings allowing the hubs to shift laterally

17. A technician is performing a brake fluid flush and needs to determine the correct fluid type for the vehicle. The reservoir cap is missing and the vehicle does not have an owner's manual available. Which of the following is the correct action?

A. Look up the brake fluid specification in the service information system using the vehicle's year, make, model, and VIN — never assume the fluid type based on appearance or what was previously used

B. Use DOT 3 since it is compatible with all vehicles manufactured after 1990

C. Use DOT 5 silicone fluid because it is the highest DOT rating and therefore the best quality

D. Match the fluid type to the color of the fluid currently in the reservoir

18. A vehicle has a check engine light and the scan tool shows DTC P0113 (Intake Air Temperature Sensor 1 Circuit High). The scan tool displays the IAT reading as -40°F with the engine warm. Which of the following is the MOST likely cause?

A. The IAT sensor has a short circuit that is pulling the signal voltage to ground

B. The IAT sensor is reporting accurately because the intake air is being super-cooled by the A/C evaporator

C. The scan tool is malfunctioning and reporting an incorrect value

D. The IAT sensor circuit has an open — the PCM's pull-up resistor drives the signal voltage to its maximum value when the sensor circuit is open, and the PCM interprets this maximum voltage as the coldest possible temperature (-40°F)

19. A vehicle's automatic transmission has a shudder during torque converter clutch (TCC) lockup at light throttle cruise. The shudder disappears when the driver presses the accelerator or lifts off completely. The transmission shifts normally otherwise. Which of the following is the correct FIRST action?

A. Remove and replace the torque converter

B. Replace the transmission control module

C. Verify the transmission fluid is the correct type specified by the manufacturer — TCC shudder is frequently caused by using the wrong fluid specification, as different fluids have different friction modifier properties that directly affect clutch engagement quality

D. Replace the transmission output speed sensor

20. A vehicle's power window on the passenger side operates normally from the passenger door switch but does not respond to the driver's door master switch. All other windows operate correctly from the master switch. Which of the following is the MOST likely cause?

A. The passenger window motor is failing and only responds to direct switch voltage

B. The driver's master switch has a failed contact for the passenger window circuit — since all other windows work from the master switch, the switch assembly's internal contact for that one window position has failed

C. The BCM has lost communication with the passenger door module

D. The passenger window has a wiring fault between the two doors

21. Technician A says that when performing a compression test, all spark plugs should be removed before testing to allow the engine to crank at a consistent speed. Technician B says that only the spark plug on the cylinder being tested needs to be removed. Who is correct?

A. Technician A only — removing all spark plugs eliminates compression resistance from the non-tested cylinders, allowing the starter to crank the engine at a uniform speed; testing with other plugs installed creates inconsistent cranking speeds between cylinders, producing unreliable comparative readings

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

22. A vehicle's exhaust has a strong sulfur smell and the catalytic converter temperature is significantly higher than normal during a scan tool infrared comparison — the outlet temperature is 200°F higher than the inlet. Which of the following is the MOST likely cause?

A. The catalytic converter has failed and is not processing exhaust gases

B. The exhaust manifold has a leak before the converter

C. The converter temperature difference is normal and indicates efficient operation

D. The engine is running excessively rich, sending large amounts of unburned fuel into the converter where it ignites and creates excessive heat — this condition will eventually destroy the converter substrate if not corrected

23. A vehicle with a turbocharged engine loses power and produces black smoke under acceleration. The turbocharger boost gauge (or scan tool boost reading) shows boost pressure below specification. There are no unusual noises from the turbocharger. Which of the following is the MOST likely cause?

A. A restricted air filter that is limiting airflow into the compressor

B. A failing turbocharger bearing that is causing the compressor wheel to contact the housing

C. A wastegate that is stuck open, preventing the turbocharger from building full boost pressure because exhaust gas is bypassing the turbine wheel

D. A clogged catalytic converter creating excessive backpressure

24. A technician is checking a vehicle's spare tire during a multi-point inspection. The spare is a compact (temporary) spare tire. Which of the following is an important inspection point that is often overlooked?

A. The spare tire's inflation pressure — compact spares require a much higher inflation pressure (typically 60 psi) than the road tires, and they frequently lose pressure over years of non-use; a flat spare tire is useless in an emergency

B. The spare tire's tread depth, which should match the road tires

C. The spare tire's wheel lug pattern, which may have changed since the vehicle was manufactured

D. Whether the spare tire has been balanced, as an unbalanced spare causes vibration

25. A vehicle's engine cranks at normal speed but takes 5–7 seconds of cranking before it starts. Once running, the engine operates normally with no DTCs. The extended crank occurs on both cold and warm starts. Which of the following is the MOST likely cause?

A. A weak ignition coil that requires multiple rotations to build adequate voltage

B. A fuel system that is losing prime — the fuel pump check valve, a leaking injector, or a faulty fuel pressure regulator is allowing fuel rail pressure to bleed off between starts, requiring extended cranking to rebuild pressure before the engine can fire

C. A faulty crankshaft position sensor that generates a weak signal during the first few rotations

D. A worn starter motor that cranks too slowly for the first few seconds

26. A customer reports that the vehicle's turn signals work normally but the hazard flashers flash at a much faster rate than normal. Which of the following is the MOST likely cause?

A. The hazard flasher relay is a different type than the turn signal flasher and is malfunctioning

B. A short circuit in the hazard light wiring that increases current flow through the flasher

C. The BCM is commanding a faster flash rate during hazard operation as a design feature

D. One or more exterior bulbs that are shared between the turn signal and hazard circuits have a burned-out filament that only affects the hazard mode due to different circuit routing — the lower total resistance causes the hazard flasher to cycle faster

27. A vehicle's cooling fan runs for several minutes AFTER the engine is shut off. The customer is concerned about battery drain. Which of the following is correct?

A. This is a normal feature on many modern vehicles — the PCM or fan control module commands the fan to continue running after shutdown to dissipate residual engine heat and prevent heat soak damage to underhood components; the run time is limited and will not drain the battery

B. The fan relay has welded contacts and the fan will run until the battery is dead

C. The engine coolant temperature sensor is stuck reading hot and must be replaced

D. The fan motor has developed an internal short that bypasses the relay

28. A vehicle's steering pulls to the right. The technician performs a tire swap test — moving the front tires left to right and right to left. The pull reverses to the left after the swap. What does this confirm?

A. The vehicle has an alignment problem that coincidentally matches the tire defect

B. The power steering system is causing the pull through unequal assist

C. One of the front tires has a radial pull (conicity or ply steer) that is causing the directional pull — the pull follows the tire position, not the vehicle, confirming the tire is the cause

D. The front wheel bearings are worn unevenly side to side

29. A vehicle has a coolant leak that appears to come from the front of the engine where the timing cover meets the engine block. The timing cover gasket was replaced 10,000 miles ago. Which of the following should the technician investigate BEFORE condemning the gasket repair?

A. The radiator cap pressure rating

B. The front crankshaft seal (timing cover oil seal area) and the water pump — both are located in the same area and their leaks can appear identical to a timing cover gasket leak; the technician must clean the area, add UV dye, and operate the engine to determine the actual leak source

C. The thermostat housing gasket located at the rear of the engine

D. The heater core hose connections

30. A vehicle's transmission dipstick shows the fluid level is above the full mark. The fluid was recently changed at another shop. Which of the following is a potential consequence of an overfilled automatic transmission?

A. No consequence — automatic transmissions safely handle any fluid level above the minimum

B. The excess fluid will be automatically expelled through the transmission vent

C. Overfilling improves shift quality by providing extra pressure volume

D. The rotating components (planetary gears, clutch drums) can contact the fluid and churn it into foam, causing aeration that produces erratic shifts, slipping, overheating, and potential seal damage from the foamed fluid expanding and being forced past seals and out the vent

31. A vehicle's scan tool Mode $06 data shows that the catalytic converter monitor oxygen storage test results are very close to the failing threshold but have not yet exceeded it. No DTC is stored. What does this tell the technician?

A. The catalytic converter is deteriorating and approaching the point where it will fail the OBD II monitor and set a P0420/P0430 code — the customer should be advised that converter replacement may be needed in the near future even though no code is currently present

B. The converter is operating at peak efficiency

C. Mode $06 data is unreliable and should never be used for diagnostic purposes

D. The converter has already failed but the PCM is not reporting the failure correctly

32. A vehicle has a whining noise from the rear that changes pitch with vehicle speed. The noise is present in Drive and Neutral while coasting. Raising the rear of the vehicle and spinning the wheels by hand while listening at the differential housing reproduces the noise. Which of the following is the MOST likely cause?

A. Worn rear wheel bearings on both sides

B. Rear tire noise from an aggressive tread pattern

C. A worn differential bearing (carrier bearing or pinion bearing) or gear set inside the differential — the noise being reproducible by spinning the wheels with the vehicle lifted and localizable to the differential housing confirms an internal differential component as the source

D. A worn rear axle shaft that is vibrating at speed

33. A vehicle's brake warning light illuminates ONLY when the vehicle is making a right turn. The brake fluid level is correct and the parking brake is fully released. Which of the following is the MOST likely cause?

A. A faulty ABS module that activates the brake warning light during steering input

B. A worn right front wheel bearing that triggers the brake warning system

C. The parking brake switch is misadjusted and makes contact during body roll

D. The brake fluid level is at the exact threshold of the float sensor — during a right turn, the fluid shifts to the right side of the reservoir, momentarily dropping the level on the left side below the sensor trigger point and illuminating the warning light

34. A customer requests that the technician install aftermarket LED bulbs in the vehicle's factory halogen headlight housings. Which of the following is the correct response?

A. LED bulbs always provide superior lighting in any housing and should be installed as requested

B. Aftermarket LED bulbs installed in housings designed for halogen bulbs typically produce improper beam patterns that scatter light, reduce effective forward illumination, and create dangerous glare for

oncoming drivers — the technician should advise the customer that this modification may not comply with federal lighting standards and could create a safety hazard

C. LED bulbs require a higher-amperage fuse that must be installed before the bulbs

D. LED bulbs are interchangeable with halogen as long as the base type matches

35. A vehicle with a conventional distributor ignition system has an engine miss at idle. The technician removes the distributor cap and finds moisture droplets inside the cap and on the rotor. Which of the following is the correct action?

A. This moisture contamination is a common cause of ignition misfire — the cap and rotor should be dried or replaced and the engine retested

B. Immediately replace the engine because moisture inside the engine is a sign of a cracked block

C. The moisture indicates the cap and rotor should be dried, inspected for carbon tracking, and replaced if carbon tracks (conductive paths burned into the plastic) are present — carbon tracking provides a permanent short-circuit path for ignition voltage even after the moisture evaporates

D. Apply dielectric grease inside the cap and reinstall it without further inspection

36. A vehicle's power steering fluid is dark brown and has a burned smell. The power steering pump whines constantly. Which of the following is the correct recommendation?

A. The fluid condition indicates the pump has been operating under stress — potentially from a restriction, overheating, or contamination — and the degraded fluid is now accelerating wear on all system components; a complete system flush, replacement of the fluid with the correct specification, and inspection of the pump and rack for damage is the minimum recommended service

B. Add a power steering conditioner additive to restore the fluid properties

C. The dark color is normal for high-mileage power steering fluid and requires no action

D. Drain and refill the reservoir only — flushing the entire system is unnecessary

37. A technician is diagnosing a vehicle that stalls at idle when the A/C is turned on AND the headlights are on simultaneously. The engine idles normally with either the A/C or headlights on individually. Which of the following is the MOST likely cause?

A. The headlight circuit has a ground fault that only manifests when the A/C compressor changes the engine's ground potential

B. The blower motor resistor is creating excessive load on the engine

C. The headlight switch is drawing excessive current through corroded contacts

D. The combined electrical load of the A/C compressor and headlights exceeds the idle speed compensation capacity of the idle air control system or electronic throttle — the PCM cannot command enough additional air or throttle opening to maintain idle under the combined load

38. A vehicle's tire has a sidewall bulge — a visible bubble protruding from the side of the tire. There is no air leaking and the tire holds pressure. Which of the following is the correct recommendation?

A. Monitor the bulge and replace the tire only if it grows larger

B. Replace the tire immediately — a sidewall bulge indicates internal structural damage (broken cords or plies) that has created a weak point in the tire's casing; the bulge can rupture without warning during driving, especially at highway speed or under heavy load, and cannot be repaired

C. Repair the sidewall damage with an internal patch

D. Reduce the tire pressure to 20 psi to decrease stress on the damaged area

39. A vehicle's engine has a rough idle and the scan tool shows STFT at -28% on Bank 1 and -2% on Bank 2. Which of the following is the MOST likely cause?

A. A vacuum leak on Bank 1 causing a lean condition

B. A contaminated MAF sensor underreporting airflow on both banks

C. A rich condition on Bank 1 — the large negative STFT means the PCM is removing 28% fuel to compensate for excessive richness on that bank; possible causes include a leaking Bank 1 fuel injector, a cracked fuel pressure regulator diaphragm feeding fuel to the Bank 1 intake runner, or a saturated EVAP canister purging into the Bank 1 intake

D. A faulty upstream O2 sensor on Bank 2

40. A customer states that the vehicle's cruise control has become erratic — it surges and slows at random intervals instead of maintaining a steady speed. There are no DTCs. All of the following could cause this EXCEPT:

A. A dirty or sticking throttle body that cannot hold a precise position

B. A worn or stretched cruise control cable that has excessive slack (on cable-operated systems)

C. An intermittent vehicle speed sensor signal that fluctuates

D. A non-functional horn switch in the steering wheel

41. A vehicle's engine oil consumption has increased to approximately one quart every 1,000 miles. There is no visible oil leak, no blue smoke from the exhaust, and the PCV system is functioning correctly. Which of the following is the MOST likely cause?

A. Oil is being consumed internally through the valve stem seals or piston rings at a rate that burns cleanly enough to not produce visible smoke — the catalytic converter can mask small amounts of oil burning by oxidizing the oil vapor before it exits the tailpipe as visible blue smoke

B. The oil is evaporating from the engine's heat and escaping through the oil filler cap

C. The oil drain plug gasket is leaking at a rate exactly matching the consumption rate

D. The dipstick is reading incorrectly, making it appear as though oil is being consumed

42. Technician A says that when a wheel stud is broken, it should be replaced with the same grade and type of stud. Technician B says that a single broken stud can be left out of service as long as the remaining studs are properly torqued. Who is correct?

A. Both Technician A and Technician B

B. Technician A only — every wheel stud is designed to carry a specific portion of the clamping load that holds the wheel against the hub; a missing stud increases the load on the remaining studs beyond their design capacity, potentially leading to progressive stud failure and wheel separation; the broken stud must be replaced with the correct grade before the vehicle is returned to service

C. Technician B only

D. Neither Technician A nor Technician B

43. A vehicle has a popping sound from the exhaust during deceleration. The sound occurs as single, random pops — not a steady backfire. There are no DTCs. Which of the following is the MOST likely cause?

A. A small exhaust leak near the exhaust manifold that allows air to enter the exhaust stream during the high vacuum of deceleration — the air mixes with unburned fuel in the hot exhaust and ignites, producing the popping sound

B. A faulty catalytic converter that is misfiring internally

C. A worn exhaust camshaft lobe causing incorrect valve timing

D. A cracked muffler baffle that resonates during deceleration

44. A vehicle's A/C system was previously repaired using a stop-leak product added to the refrigerant. The customer now brings the vehicle in for an A/C service. Which of the following is a concern with stop-leak products?

A. Stop-leak products improve system reliability and have no negative effects

B. Stop-leak has no effect on recovery/recycling equipment

C. Stop-leak products can contaminate the recovery/recycling/recharge (RRR) machine, clog the orifice tube or expansion valve, damage the compressor, and may void the warranty on any subsequently installed A/C components — the technician must use a refrigerant identifier to check for contamination before connecting the RRR machine

D. Stop-leak only affects the condenser and has no impact on other components

45. A vehicle has been in a minor front-end collision. The damage appears cosmetic — bumper cover, grille, and hood are damaged. No airbags deployed. The customer wants only the cosmetic repairs performed. Which of the following should the technician also verify?

A. That the engine oil was not contaminated by the impact

B. That the radiator support, core support structure, and any ADAS components (radar, cameras) behind the bumper are undamaged and properly positioned — structural damage and sensor misalignment can be hidden behind cosmetic panels and create serious safety issues if undetected

C. That the fuel tank was not damaged in a front-end impact

D. That the rear suspension was not affected by the frontal force

46. A vehicle's engine has an oil leak at the rear of the engine near the transmission bellhousing. Oil is dripping from the lowest point of the bellhousing. Which of the following is the correct diagnostic approach?

A. Replace the rear main seal immediately since oil at the bellhousing always indicates a rear main seal leak

B. Replace the transmission input shaft seal since oil in the bellhousing always comes from the transmission

C. Add UV dye to both the engine oil and the transmission fluid, operate the vehicle, and re-inspect with a UV light to determine whether the leak is engine oil (rear main seal, oil pan rear gasket) or transmission fluid (input shaft seal or front pump seal)

D. The oil at the bellhousing is a combination of both engine oil and transmission fluid from separate leaks, and both seals should be replaced simultaneously without further testing

47. A vehicle's TPMS warning light is flashing for 60–90 seconds after engine start, then stays on solid for the remainder of the drive. After stopping and restarting, the same flash-then-solid pattern repeats. Which of the following is the correct interpretation?

A. All four tires are underinflated and the system is providing an urgent warning

B. The vehicle's battery is low, affecting the TPMS module's ability to receive signals

C. The customer recently filled the tires and the system needs to recalibrate

D. The flash-then-solid pattern indicates a TPMS system fault — not a low tire pressure condition; a sensor has failed, lost communication, or the TPMS module has an internal error that must be diagnosed with a scan tool or TPMS activation tool

48. A vehicle's engine has an intermittent stumble at highway speed. The scan tool shows no DTCs, but the technician notices that the fuel trim values momentarily spike to +20% STFT for 1–2 seconds and then return to normal. This spike occurs every 30–45 seconds. Which of the following is the MOST likely cause?

A. A failing MAF sensor that intermittently drops its signal

B. An injector that is sticking closed momentarily before opening

C. An intermittent lean condition caused by a momentary vacuum leak, a sticking EVAP purge valve that opens briefly and then closes, or a fuel delivery interruption (weak fuel pump momentarily losing pressure) that occurs at regular intervals

D. A loose spark plug that misfires intermittently under load

49. A vehicle equipped with manual-locking front hubs (found on some older 4WD trucks) will not engage 4WD. The transfer case shifts into 4WD and the indicator light illuminates, but the front wheels do not receive power. Which of the following is the MOST likely cause?

A. The front differential has failed internally

B. The manual locking hubs are not engaged — the driver must physically turn the hub locks on both front wheels to the LOCK position to connect the front wheels to the front axle shafts; the transfer case can shift into 4WD, but without the hubs locked, the front wheels freewheel

C. The transfer case is not actually engaging despite the indicator light

D. The front driveshaft U-joints have failed simultaneously

50. A vehicle's check engine light is on with DTC P0174 (System Too Lean — Bank 2). The technician finds that the Bank 2 upstream O2 sensor voltage is stuck at approximately 0.1 volts (lean). Propane is introduced near the intake. The O2 sensor voltage immediately rises to 0.9 volts (rich). What does this test confirm?

A. The O2 sensor IS responding to changes in exhaust oxygen content — it is NOT stuck or failed; the steady 0.1V reading is caused by a genuine lean condition on Bank 2, and the technician must now find the actual source of the lean condition (vacuum leak, fuel delivery issue) rather than replacing the sensor

B. The O2 sensor has failed and is reading lean falsely

C. The catalytic converter on Bank 2 is masking the true sensor reading

D. The propane test is inconclusive and the sensor should be replaced as a precaution

51. A customer brings in a vehicle with a complaint that the steering wheel shakes between 55 and 65 mph but is smooth below and above that range. Tire balance has been verified. The tires are 4 years old with adequate tread. Which of the following should the technician investigate?

A. Possible tire flat-spotting from age-related stiffening

B. Front brake rotor lateral runout

C. Power steering pump output at highway speed

D. The tires may have developed a radial force variation or flat spots from age-related rubber hardening — even with correct balance, the internal structure of aging tires can develop inconsistencies that produce speed-specific resonance vibrations; replacing the aged tires often resolves vibrations that no amount of balancing can correct

52. A vehicle with an electronic throttle body requires a throttle body cleaning due to carbon buildup. After cleaning, the engine idles at 1,500 RPM and will not return to normal idle. There are no DTCs. Which of the following is the MOST likely cause?

A. The throttle body cleaning damaged the internal throttle motor

B. The IAC valve passage is still clogged despite cleaning the throttle plate

C. The PCM's learned idle position no longer matches the actual throttle plate position after cleaning changed the airflow characteristics — a throttle body relearn procedure must be performed with a scan tool to allow the PCM to recalibrate its idle control to the cleaned throttle body

D. The throttle position sensor was knocked out of calibration during cleaning

53. A vehicle's windshield wiper motor runs but the wipers do not move. The technician can hear the motor operating inside the cowl area. Which of the following is the MOST likely cause?

A. The wiper linkage has disconnected from the wiper motor crank arm — the motor is running but the mechanical connection to the wiper arms has separated, so the motor spins without moving the wipers

B. The wiper motor is seized and is only producing a humming sound without actual rotation

C. The wiper fuse is partially blown, providing enough current for the motor to hum but not enough to drive the wipers

D. The windshield washer pump is running instead of the wiper motor

54. A technician is replacing the front struts on a vehicle. The service information specifies a strut-to-knuckle bolt torque of 140 ft-lbs. The technician's torque wrench only goes to 100 ft-lbs. Which of the following is the correct action?

A. Tighten the bolts to 100 ft-lbs and note the reduced torque on the repair order

B. Obtain a torque wrench with a range that covers the required 140 ft-lbs specification — using a torque wrench at or beyond its maximum rated capacity produces inaccurate readings, and under-torquing a critical suspension fastener risks bolt failure and loss of vehicle control

C. Use an extension bar on the 100 ft-lbs torque wrench handle to achieve the higher torque

D. Tighten the bolts as tight as possible with the 100 ft-lbs wrench and then give an additional quarter turn

55. A vehicle has been brought in for a complaint of poor heater output. The engine reaches full operating temperature. Both heater hoses are hot to the touch and approximately the same temperature. The blower motor works on all speeds. The temperature blend control moves freely. Which of the following is the MOST likely cause?

A. A stuck-closed thermostat preventing proper warm-up

B. A restricted heater core not flowing adequate coolant volume

C. A faulty coolant temperature sensor causing the PCM to incorrectly limit heater performance

D. The heater core may have internal bypass or the blend door actuator may not be moving the door to the full hot position despite the control moving — the fact that both heater hoses are nearly the same temperature could indicate coolant is flowing through but not transferring heat effectively, or the door position needs verification with a scan tool or visual inspection through the HVAC case

Practice Exam 11: Answer Key and Full Explanations

1. C — Diesel engines rely on compression heat to ignite fuel — there are no spark plugs. Glow plugs are electrically heated elements that pre-warm the combustion chambers to assist cold ignition. When one or more glow plugs fail, the affected cylinders do not reach adequate temperature for reliable fuel ignition during cold cranking. The engine eventually starts once compression heat alone — generated by extended cranking — raises cylinder temperatures enough for combustion to occur.

2. A — Bench bleeding is a mandatory procedure before installing a new master cylinder. The master cylinder's internal bore, pistons, and ports can trap air pockets that are extremely difficult to remove once installed on the vehicle. By clamping the cylinder in a vise and cycling the piston with the output ports looped back to the reservoir (or plugged with bleeder fittings), all internal air is purged before installation. Skipping this step results in a spongy pedal that conventional bleeding cannot fully correct.

3. B — A rhythmic thump occurring exactly once per wheel revolution that does not change with braking or steering is characteristic of a tire surface irregularity. A flat spot (from skidding, brake lockup, or prolonged stationary storage), an embedded object that protrudes slightly from the tread, or a tread separation creating a raised area all produce a single thump per revolution as the irregularity contacts the road surface. Wheel bearing noise is continuous, not rhythmic, and brake-related noise changes with pedal application.

4. D — OBD II uses three distinct code statuses that convey different diagnostic information. A pending code has been detected once but hasn't completed enough consecutive fault trips to illuminate the MIL — it's an early warning. A confirmed (current) code has met the MIL illumination criteria and is actively flagging the driver. A permanent code is stored in protected PCM memory that survives scan tool clearing and battery disconnection — it can only be removed by the PCM itself after verifying the repair through a successful monitored drive cycle.

5. A — Technician A is correct. An OAD (overrunning alternator decoupler) pulley contains a one-way clutch that allows the alternator rotor to freewheel momentarily when the crankshaft decelerates rapidly (such as during gear shifts or throttle release). This prevents the alternator's rotational inertia from fighting the belt and causing slip, chirp, or premature belt wear. When the OAD clutch fails — either locking solid or freewheeling in both directions — belt noise and abnormal wear return. Testing with a specialized OAD tool is required during any belt noise diagnosis on vehicles so equipped.

6. C — Driveshafts are precision-balanced as an assembly at the factory, and a specific rotational position (index) on the companion flange is marked to maintain that balance. When the driveshaft is removed, it must be reinstalled in exactly the same bolt-hole orientation on the flange. Rotating the driveshaft to a different bolt position shifts its balance point, introducing a vibration that was not present before the service. Marking the driveshaft-to-flange relationship before removal prevents this common comeback.

7. B — A clunk felt directly through the steering wheel when reversing direction — with all external steering and suspension components tight — points to an internal joint in the steering column itself. The intermediate shaft connects the steering column to the steering gear through one or two universal joints or flexible couplings. When these joints wear, they develop rotational play that produces a distinct clunk when the steering wheel's rotational direction reverses. The clunk is transmitted directly through the column to the driver's hands.

8. B — The left rear caliper responded to the scan tool retract command, confirming the scan tool, communication network, and EPB module are all functioning. The right rear did not respond, which isolates the fault to the right rear caliper's specific circuit. The simplest and most common failure is a disconnected, corroded, or damaged wiring connector at the motor — the motor cannot receive the electrical command to retract. Checking power, ground, and connector integrity at the motor before condemning the motor itself follows the diagnostic principle of checking the cheapest and most accessible component first.

9. D — A noise from the timing cover area that tracks directly with engine RPM and is present at all temperatures indicates a timing chain or timing chain tensioner/guide issue. As timing chains stretch

with mileage, they develop slack that the tensioner can no longer compensate for. The excess chain whips and contacts the inside of the timing cover or the worn guides, producing a tapping or rattling sound. Unlike lifter noise (which may change with temperature) or exhaust leaks (which may seal when hot), timing chain noise is consistent hot or cold.

10. A — Air filter replacement intervals printed in the owner's manual are based on average driving conditions. Vehicles driven in dusty environments, urban traffic with high particulate levels, or on unpaved roads will clog filters much faster than the mileage interval suggests. Visual inspection is the definitive method — a visibly dirty filter is restricting airflow regardless of mileage. Replacing a dirty filter at 22,000 miles rather than waiting until 30,000 is correct maintenance based on actual condition.

11. C — With the sensor and wiring verified intact visually, the next diagnostic step targets the signal source — the tone ring. A tone ring with a cracked, chipped, or missing tooth produces a signal gap that the ABS module interprets as a wheel speed dropout. Additionally, the air gap between the sensor tip and the tone ring must fall within specification — if the gap is too large (from hub bearing wear, debris accumulation, or sensor mounting issues), the signal amplitude drops below the module's detection threshold. Both the tone ring condition and the air gap must be verified.

12. D — A radiator hose that is rock-hard at operating temperature indicates the cooling system is pressurized beyond its normal operating range. The radiator cap is designed to relieve pressure at a specific threshold (typically 13–18 psi). If the cap's relief valve is stuck closed or has a higher-than-specified rating, pressure builds without limit. Alternatively, a head gasket leak pushing combustion gases into the coolant creates pressure that overwhelms the cap's relief capacity. Both conditions are dangerous — excessive pressure can rupture hoses, blow gaskets, and cause explosive coolant release.

13. A — A pulsation that appears AFTER rotor machining but was NOT present before has two primary causes: an improper surface finish from dull or damaged lathe bits (creating a rough surface that wears unevenly), or lateral runout induced during reinstallation by contamination between the rotor and hub face. The same hub-surface cleaning procedure required for new rotors applies to machined rotors. Even microscopic rust or debris between the rotor hat and the hub mounting surface creates runout that the lathe work cannot prevent.

14. C — Automotive coolant is engineered to maintain an alkaline pH (typically 8.0–11.0) through chemical corrosion inhibitors that protect the dissimilar metals in the cooling system. As these inhibitors deplete over time and miles, the pH drops toward neutral and eventually becomes acidic. At a pH of 7.0, the protective alkaline barrier is gone, and the coolant is actively corroding aluminum, copper, solder joints, and iron components from the inside. The coolant should be flushed and replaced with fresh coolant to restore corrosion protection.

15. D — Modern extended oil change intervals are the result of three converging improvements: synthetic and semi-synthetic base oils with superior thermal stability and oxidation resistance; advanced additive packages with longer-lasting detergents, dispersants, and anti-wear compounds; and tighter manufacturing tolerances that reduce combustion blowby and contamination. Oil life monitoring systems add real-time intelligence by tracking operating conditions (temperature, RPM, load, cold starts, idle time) to calculate when the oil's actual protective capacity — not just its mileage — is depleted.

16. B — Excessive steering play at the center position — where the steering wheel rotates before the wheels respond — with tight ball joints and tie rod ends isolates the play to the steering gear itself. In a rack-and-pinion system, a worn rack bearing, loose adjuster plug, or worn pinion teeth allow internal free play. In a recirculating ball system, worn worm gear teeth, a loose sector shaft adjustment, or worn ball bearings create the same dead-center looseness. Adjusting the gear preload (where possible) or replacing the gear eliminates the play.

17. A — Brake fluid specifications vary by vehicle and sometimes by model year — DOT 3, DOT 4, DOT 4 LV, DOT 5.1, and specialized OEM fluids all have different boiling points, viscosities, and chemical compositions. Using the wrong fluid can damage ABS seals, degrade braking performance, or cause system corrosion. With no owner's manual or reservoir cap to reference, the service information system is the definitive source for the correct specification. Never assume fluid type based on what's in the reservoir — the previous shop may have used the wrong fluid.

18. D — The IAT sensor is an NTC thermistor: high temperature = low resistance = low voltage. An OPEN circuit in the sensor or its wiring means infinite resistance. The PCM's internal pull-up resistor drives the signal to maximum voltage (typically 4.9–5.0V), which the PCM's temperature lookup table maps to the coldest possible value: -40°F. This is the opposite of the ECT sensor open-circuit behavior on many systems. The -40°F reading with a warm engine is physically impossible and is the PCM's diagnostic default for a sensor circuit that has lost continuity.

19. C — TCC shudder during light-throttle lockup is one of the most commonly misdiagnosed transmission complaints. Before condemning the torque converter or any internal components, the fluid specification must be verified. Automatic transmission fluids contain precisely engineered friction modifiers that control how the TCC clutch engages. If the wrong fluid is installed — even if it looks identical and is labeled "universal" — the friction characteristics change and the clutch slips during engagement, producing the shudder. Draining and refilling with the correct OEM-specified fluid resolves the shudder in a large percentage of cases.

20. B — Since all other windows operate correctly from the master switch (confirming the switch assembly receives power, has a good ground, and communicates with the BCM), the fault is isolated to

the one window position that does not work from the master switch. The passenger window motor is confirmed functional because it works from the passenger door switch. The master switch contains separate internal contact sets for each window — when one contact burns, corrodes, or loses its spring tension, only that window position is affected while all others continue to function normally.

21. A — Technician A is correct. A compression test compares cylinder pressures across all cylinders, and the validity of the comparison depends on consistent cranking speed. With all plugs removed, the starter spins the engine with minimal resistance, producing uniform cranking speed across all cylinders. With plugs installed in non-tested cylinders, the starter must overcome their compression, which slows cranking speed unevenly — a cylinder tested with other plugs installed may read lower simply because the engine cranked more slowly, not because the cylinder has a mechanical problem.

22. D — A catalytic converter's inlet-to-outlet temperature differential reveals its operating condition. A healthy converter typically shows a moderate temperature rise (50–100°F) as it processes exhaust gases. A 200°F outlet-over-inlet differential indicates the converter is generating extreme internal heat from burning excess fuel. The sulfur smell confirms rich combustion byproducts are being processed. This excessive exothermic reaction will eventually melt the converter substrate. The root cause — a rich engine condition — must be corrected to save the converter.

23. C — The wastegate's purpose is to bypass exhaust gas around the turbine wheel to LIMIT maximum boost pressure. When the wastegate is stuck open, exhaust gas constantly bypasses the turbine — even at times when full boost is needed. The turbine receives insufficient exhaust energy to spin the compressor wheel fast enough to build target boost pressure. Low boost = reduced airflow = reduced power. Black smoke indicates the PCM is commanding full fuel delivery based on throttle position, but the actual air charge is too low, creating an excessively rich mixture.

24. A — Compact spare tires typically require 60 psi — significantly higher than the 32–36 psi specified for regular road tires. Because spare tires sit unused for years, they gradually lose pressure through natural permeation. A spare that has dropped to 30 psi or below is functionally useless in a roadside emergency — it will be visibly flat when mounted and may damage itself during even short-distance driving. Checking and correcting spare tire pressure during every multi-point inspection ensures the customer has a functional emergency spare when they need it.

25. B — An extended crank time that occurs on BOTH cold and warm starts (eliminating temperature-related causes) points to a fuel system that is losing rail pressure between key cycles. When the engine is off, residual pressure should hold in the fuel rail to enable immediate startup. A leaking fuel pump check valve allows fuel to drain back to the tank. A leaking fuel injector allows fuel to seep into the cylinder.

A faulty fuel pressure regulator allows pressure to bleed off. All three cause the same symptom: extended cranking while the pump rebuilds pressure from zero.

26. D — Turn signal and hazard circuits often share the same external bulbs but use different internal circuit paths and different flasher units (or different BCM output drivers). If a dual-filament bulb has one burned-out filament, it may work on the turn signal circuit (which uses one filament) while failing on the hazard circuit (which uses the other filament). The reduced number of working bulbs in the hazard circuit lowers total resistance, causing the flasher to cycle faster — producing the hyper-flash that indicates a bulb failure.

27. A — Many modern vehicles are programmed to continue running the radiator cooling fan after engine shutdown to prevent heat soak. When the engine stops, coolant circulation ceases but the residual heat in the engine block continues to raise coolant temperature — a phenomenon called heat soak. The fan runs until the ECT sensor reports a temperature drop below the shutdown threshold, typically 1–5 minutes. This is a deliberate PCM-controlled function with built-in timer limits that does not drain the battery under normal conditions.

28. C — The tire swap test is the definitive diagnostic procedure for directional tire pull. Swapping the front tires side-to-side changes which tire is on the pulling side. If the pull reverses direction after the swap, the cause is confirmed as the tire — specifically, a manufacturing characteristic called radial pull (conicity or ply steer) where the tire's internal belt structure creates a lateral force in one direction. If the pull stayed the same after the swap, the vehicle's alignment would be the cause.

29. B — The timing cover area of the engine is a convergence point for multiple potential leak sources: the timing cover gasket, the front crankshaft seal, and the water pump (which is often mounted on or near the timing cover). All three can drip from the same location, making visual identification unreliable when the area is wet. Cleaning the area completely, adding UV dye to the engine oil (and coolant if a water pump is suspected), running the engine, and re-inspecting with a UV light traces each fluid to its individual source point.

30. D — An overfilled automatic transmission creates the same problem as overfilled engine oil — the rotating internal components dip into the excess fluid and churn it into a frothy, aerated mixture. Aerated transmission fluid compresses (unlike solid fluid), causing clutch packs to slip and shift quality to degrade. The foaming fluid expands in volume, increasing internal pressure that forces fluid past seals and out the vent tube. The resulting fluid loss then creates a DIFFERENT set of problems (low fluid level), compounding the damage.

31. A — Mode $06 data provides raw test results from OBD II monitors BEFORE they pass or fail. When the catalytic converter oxygen storage test value is approaching the failure threshold, the converter is clearly deteriorating but hasn't yet failed the monitor's pass/fail criteria. This is predictive diagnostic information — the technician can advise the customer that converter replacement is likely needed in the near future, allowing them to plan and budget rather than being surprised by a sudden check engine light and potential emissions test failure.

32. C — The diagnostic process has isolated the noise to inside the differential housing: the noise reproduces when spinning the wheels on a lift and is localizable to the differential. With the noise confirmed as internal to the housing, the possible sources are the carrier bearings (which support the differential case), the pinion bearings (which support the pinion gear), or the ring and pinion gear mesh itself. All of these components rotate whenever the wheels turn and produce a whining or howling noise when worn or improperly adjusted.

33. D — This is a fluid dynamics question. The brake fluid level sensor is a float switch that sits at a specific position in the reservoir. When the fluid is at the exact triggering threshold, any lateral movement of the fluid can momentarily expose the float. During a right turn, centrifugal force pushes the fluid toward the right side of the reservoir, lowering the level on the left side where the sensor may be positioned. This momentary drop triggers the warning light, which extinguishes when the vehicle straightens and the fluid level equalizes.

34. B — Halogen headlight housings use precisely calculated reflector geometry and lens optics designed for a halogen bulb's specific light source position, shape, and emission pattern. LED bulbs have a fundamentally different light emission geometry — LEDs emit light from flat surfaces at specific angles rather than from a cylindrical filament. This mismatch between the LED's emission pattern and the halogen housing's reflector geometry produces scattered, unfocused light that glares oncoming drivers while actually reducing the driver's effective forward illumination distance.

35. C — Moisture inside a distributor cap creates a conductive path for high-voltage ignition energy to short to ground instead of traveling to the spark plug. Drying the cap resolves the immediate misfire, but the real concern is carbon tracking — microscopic conductive carbon paths burned into the cap's plastic surface when voltage arced through the moisture. Even after drying, these carbon tracks provide a permanent low-resistance path that allows ignition energy to leak to ground, causing continued misfires. If carbon tracks are present, the cap and rotor must be replaced.

36. A — Dark, burnt-smelling power steering fluid indicates the fluid has been overheated and its molecular structure has broken down. Degraded fluid loses its lubricating properties, increases internal friction, and accelerates wear on the pump vanes, rack seals, and hose interiors. The whining pump noise

confirms the pump is already operating under stress — either from the degraded fluid's reduced lubricity or from internal wear that the bad fluid has caused. A complete system flush with the correct fresh fluid, followed by pump and rack inspection, is the minimum corrective action.

37. D — This question tests the concept of cumulative electrical loading at idle. The A/C compressor adds approximately 5–10 HP of parasitic load, and the headlights add approximately 10–15 amps of electrical load that the alternator must supply. Individually, the idle control system can compensate for either load. Combined, the total load exceeds the system's compensation capacity at idle — the engine cannot maintain enough airflow to overcome both the mechanical parasitic drag and the alternator's increased resistance simultaneously. The idle drops below the sustainable threshold and the engine stalls.

38. B — A sidewall bulge is a visible symptom of internal structural failure — one or more plies or cords in the tire's casing have broken, allowing the air pressure to push outward at the weak point. Unlike a tread puncture, sidewall damage is not repairable because the sidewall has no reinforcing belts. The bulge will continue to grow with each pressure cycle and heat cycle, and it can rupture catastrophically without warning — especially at highway speed where centrifugal force and heat are greatest. Immediate replacement is the only safe recommendation.

39. C — STFT of -28% on Bank 1 means the PCM is aggressively REMOVING fuel from Bank 1 to prevent an excessively rich mixture. The near-zero Bank 2 STFT confirms the fuel system baseline is correct — the problem is isolated to Bank 1. Bank-specific rich conditions include a leaking fuel injector on that bank (delivering fuel when commanded off), a ruptured fuel pressure regulator diaphragm feeding raw fuel into the Bank 1 vacuum line, or an EVAP purge valve dumping excess fuel vapor into the Bank 1 intake runner.

40. B — Cruise control maintains a set speed by controlling throttle position based on vehicle speed feedback. A dirty throttle body (cannot hold precise position), a slack cruise cable (delays throttle response), and an intermittent VSS (loses speed reference) all directly cause erratic cruise control behavior. A non-functional horn switch has NO connection to the cruise control system — the horn circuit is completely separate from the speed-maintaining function. This is the component that would NOT cause the symptom, making it the correct answer to this "all EXCEPT" question.

41. A — Oil consumption without visible smoke or external leaks is deceptive because the catalytic converter acts as a final clean-up device. Small amounts of oil vapor that pass the rings or valve seals enter the exhaust as hydrocarbon-rich gas. The catalytic converter oxidizes these hydrocarbons before they exit the tailpipe, effectively hiding the oil burning from visual detection. A quart per 1,000 miles

exceeds most manufacturers' acceptable consumption thresholds (typically 1 quart per 2,000–3,000 miles) and indicates advancing internal wear.

42. B — Technician A is correct. Every wheel stud carries a calculated share of the total clamping force that holds the wheel against the hub. On a 5-lug wheel, each stud carries 20% of the clamping load. With one stud missing, the remaining four each carry 25% — a 25% overload. This increased stress accelerates fatigue cracking in the remaining studs, and the uneven clamping pattern can cause the wheel to shift slightly on the hub, generating rotor runout and vibration. The broken stud must be replaced with the identical grade and type before the vehicle is returned to service.

43. A — During deceleration, the closed throttle creates high intake manifold vacuum. If there is a small exhaust leak near the manifold (cracked manifold, loose bolt, deteriorated gasket), the pulsing exhaust pressure waves create momentary low-pressure areas at the leak point that draw in atmospheric air. This fresh air mixes with small amounts of unburned fuel remaining in the hot exhaust and ignites, producing random single pops. The leak is often too small to produce noise during acceleration (when exhaust pressure is positive and pushes outward rather than drawing in).

44. C — A/C stop-leak products are designed to swell seals and plug small leaks from inside the system. However, the chemical compounds in these products can crystallize in the orifice tube or expansion valve, clog the receiver/drier or accumulator, damage compressor reed valves, and — most critically — contaminate the shop's RRR (recovery/recycling/recharging) machine. A contaminated RRR machine cross-contaminates every subsequent vehicle it services. A refrigerant identifier should be used before connecting to ANY vehicle's A/C system to detect stop-leak or refrigerant cross-contamination.

45. B — Modern vehicles integrate ADAS components (forward radar, parking sensors, adaptive cruise control radar) behind and within the front bumper assembly. These components can be damaged, disconnected, or displaced during even minor collisions that appear purely cosmetic from the outside. Additionally, the radiator core support structure behind the bumper cover provides crash energy management — hidden structural damage compromises future crash performance. A thorough inspection behind the cosmetic panels ensures hidden safety issues are identified and addressed.

46. D — Oil at the bottom of the bellhousing can come from two completely different sources: engine oil (leaking past the rear main crankshaft seal or the rear oil pan gasket) or transmission fluid (leaking past the transmission input shaft seal or front pump seal). Both fluids run down to the same lowest point and look similar when mixed with road grime. Adding UV dye to BOTH fluids — a different color for each — and re-inspecting after operation definitively identifies which fluid is leaking and directs the repair to the correct seal.

47. D — TPMS warning light behavior is standardized across all OBD II vehicles. A light that comes on and stays on steady indicates low tire pressure — a pressure issue. A light that FLASHES for 60–90 seconds before staying on solid indicates a system fault — a hardware or communication problem. The flash-then-solid pattern tells the technician to diagnose the TPMS system itself (dead sensor battery, missing sensor signal, module fault), not simply check tire pressures.

48. C — A brief fuel trim spike to +20% that occurs at regular intervals and then returns to normal indicates a momentary lean condition that the PCM successfully compensates for. The regularity (every 30–45 seconds) suggests a cyclical cause rather than a random fault. Common cyclical causes include an EVAP purge valve that momentarily opens and closes on a timed cycle (introducing a brief lean or rich condition), a fuel pump that momentarily loses pressure during a wear-related mechanical hiccup, or an intermittent vacuum leak from a component that cycles (like a canister purge solenoid).

49. B — Manual locking hubs are a mechanical disconnect system: even when the transfer case shifts into 4WD and sends power to the front driveshaft and front differential, the power stops at the front axle shafts unless the hub locks are physically engaged. The hub locks connect the front wheels to the axle shafts. Without them engaged, the front wheels freewheel on their bearings while the front differential and driveshaft spin uselessly. The transfer case indicator light responds to the transfer case position, not the hub lock status.

50. A — The propane enrichment test is a definitive test for O2 sensor response. By introducing propane (a combustible gas) near the intake, the mixture in the exhaust goes rich, and a functioning O2 sensor should immediately show a high voltage (0.8–0.9V). The sensor's response to 0.9V confirms it CAN detect rich conditions — the steady 0.1V reading during normal operation is therefore reporting a genuine lean condition, not a sensor failure. The technician must now find the actual lean source (vacuum leak, low fuel pressure, intake leak) instead of replacing a functional sensor.

51. D — Tires that are 4+ years old, even with adequate tread depth and correct balance, can develop internal changes that produce speed-specific vibrations. Rubber compounds harden with age (regardless of mileage), internal belt adhesion weakens, and subtle structural changes create radial force variations that a balancing machine cannot detect or correct. These age-related defects produce vibrations within specific speed windows — often 55–65 mph — where the rotational frequency matches the tire's natural resonance. Replacing the aged tires resolves vibrations that persisted through multiple balance attempts.

52. C — The electronic throttle body's idle position is a learned value stored in the PCM's adaptive memory. Before cleaning, the PCM had learned to open the throttle plate a specific amount to compensate for carbon restricting airflow. After cleaning removes the carbon, the same throttle opening now passes MORE air than the PCM expects, resulting in a higher-than-target idle speed. The throttle

body relearn procedure — performed through a scan tool or a specific ignition cycle sequence — allows the PCM to relearn the correct idle throttle position for the now-clean airflow path.

53. A — The wiper motor running (audible) but the wipers not moving means the motor is producing rotational output but the mechanical linkage is not transmitting that motion to the wiper arms. The most common failure point is the crank arm connection — a plastic ball socket, a retaining clip, or a splined coupling that connects the motor output shaft to the wiper linkage breaks or pops off. The motor spins freely, but the disconnected linkage cannot transfer motion to the wiper pivot shafts and arms.

54. B — Torque wrenches are precision instruments calibrated for a specific operating range — typically accurate to within ±4% of the indicated value when used within 20–100% of their rated capacity. Using a 100 ft-lb wrench to achieve 140 ft-lbs is beyond its range, producing inaccurate readings. Adding a handle extension (breaker bar cheater) changes the lever arm length and invalidates the torque reading entirely. The technician must obtain a wrench rated for the specification — suspension fastener torque is safety-critical and cannot be approximated.

55. D — This is a nuanced diagnostic scenario. Both heater hoses being hot AND approximately the same temperature is actually an unusual finding — normally, the inlet hose should be noticeably hotter than the outlet. If they are nearly the same temperature, coolant may be flowing through but not transferring heat effectively (internal heater core bypass or coating), or the blend door actuator may not be moving the door to full hot despite the control appearing to function. A scan tool can verify commanded versus actual blend door position, and a temperature comparison at the heater core inlet and outlet tubes (not the hoses) provides more precise data.