PRACTICE EXAM 4: ASE G1 SIMULATION — 55 QUESTIONS

1. A customer's vehicle has a steady check engine light and the scan tool retrieves DTC P0301 (Cylinder 1 Misfire Detected). The technician clears the code and the light returns within one drive cycle. All of the following could cause a singlecylinder misfire EXCEPT:

A. A fouled or worn spark plug on cylinder 1

B. A leaking fuel injector on cylinder 1 causing a rich condition in that cylinder

C. A clogged catalytic converter restricting exhaust flow

D. A burned exhaust valve on cylinder 1

2. A vehicle's brake warning light on the dashboard is illuminated. The parking brake is fully released and the brake fluid level in the master cylinder reservoir is at the minimum mark. Which of the following should the technician do NEXT?

A. Top off the brake fluid to the maximum mark and clear the warning light

B. Replace the brake fluid level sensor in the reservoir cap

C. Test the parking brake switch for proper adjustment

D. Inspect the brake system for the source of fluid loss before adding fluid

3. A technician is preparing to lift a vehicle on a twopost aboveground lift. Which of the following is the MOST important step before raising the vehicle?

A. Verify that the lift arm pads are positioned on the manufacturerspecified lift points

B. Confirm that the parking brake is set and the vehicle is in Park

C. Check that the vehicle's tires are properly inflated before lifting

D. Ensure the vehicle doors are closed and windows are rolled up

4. Technician A says that a digital multimeter (DMM) set to the ohms function should be used to measure resistance in a circuit that is energized (powered on). Technician B says that resistance measurements must be taken with the circuit deenergized and the component isolated from the circuit. 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. A customer states that the vehicle's engine runs rough for the first two minutes after a cold start and then smooths out. There are no DTCs stored. Which of the following is the MOST likely cause?

A. A leaking fuel pressure regulator diaphragm

B. A faulty engine coolant temperature sensor reporting an incorrect warmengine value

C. Worn valve stem seals allowing oil into the combustion chambers overnight

D. Leaking fuel injectors that drain fuel rail pressure during extended off periods

6. A vehicle requires a jump start every morning. The battery tests good and the charging system output is within specification. A parasitic draw test shows 40 milliamps after all modules have entered sleep mode. Which of the following is the MOST likely cause of the repeated dead battery?

A. A short trip driving pattern that does not allow the charging system to fully recharge the battery

B. A faulty voltage regulator intermittently overcharging the battery

C. An undersized battery that exceeds the maximum parasitic draw threshold

D. A corroded positive battery cable that increases circuit resistance

7. A technician is performing a brake fluid flush on a vehicle equipped with ABS. Which of the following is the correct procedure?

A. Gravity bleed each wheel cylinder and caliper starting with the closest to the master cylinder

B. Disconnect the ABS module and bleed only the base brake circuits

C. Follow the manufacturer's specific bleed sequence, which may require a scan tool to cycle ABS solenoids

D. Use a pressure bleeder on the master cylinder and bleed all four corners simultaneously

8. A vehicle's air conditioning system has no cooling output. The compressor clutch is not engaging. The technician jumps the compressor clutch relay and the compressor engages and produces cold air. Which of the following is the MOST likely cause of the original complaint?

A. An internally shorted compressor clutch coil with excessive resistance

B. An open or failed compressor clutch relay, low refrigerant pressure switch, or PCM control circuit fault

C. A seized compressor that has mechanically locked the clutch

D. A refrigerant overcharge that has hydraulically locked the compressor

9. During a wheel bearing inspection on a nondriven front wheel, the technician grasps the tire at the 12 o'clock and 6 o'clock positions and rocks it. There is noticeable play. Grasping the tire at the 3 o'clock and 9 o'clock positions produces no play. What does this indicate?

A. A worn wheel bearing or loose wheel bearing adjustment

B. A worn outer tie rod end

C. A worn lower ball joint

D. A bent spindle or steering knuckle

10. A vehicle's automatic transmission has a delayed engagement when shifting from Park to Reverse — there is a 3 to 4second delay before the vehicle begins to move backward. Forward gears engage normally. Which of the following is the MOST likely cause?

A. A worn oneway (sprag) clutch in the transmission

B. Low transmission fluid level affecting overall line pressure

C. A faulty park pawl that is slow to disengage from the output shaft

D. Worn or leaking reverse clutch pack seals or servo

11. A vehicle with a returnless fuel system has low fuel pressure. The technician turns the key to the ON position and does not hear the fuel pump prime for its normal 2second cycle. Battery voltage is confirmed at the fuel pump connector. Which of the following is the MOST likely cause?

A. A clogged fuel filter restricting flow volume

B. A faulty fuel pressure regulator venting pressure back to the tank

C. A failed fuel pump motor despite having power and ground at the connector

D. An open fuel pump relay preventing voltage from reaching the pump

12. A customer complains that the steering wheel vibrates at highway speed. The tires were recently balanced and the vibration persists. Which of the following should the technician inspect NEXT?

A. The tire tread pattern for signs of cupping or scalloped wear

B. The front brake rotors for excessive lateral runout using a dial indicator

C. The power steering fluid level for aeration

D. The steering column Ujoints for binding

13. A technician is measuring the amperage output of an alternator at full load. The specification is 120 amps. The alternator produces only 85 amps. Which of the following is the LEAST likely cause of this reduced output?

A. A slipping serpentine belt that cannot maintain alternator speed under load

B. A sulfated battery that limits the current the alternator can deliver

C. Worn alternator brushes reducing field current

D. A failed rectifier bridge with one or more open diodes

14. A vehicle with MacPherson strut front suspension exhibits a knocking sound when driving over speed bumps. The strut shaft nut is tight. Which of the following is the MOST likely cause?

A. A worn strut cartridge with internal bypass

B. Worn or deteriorated lower control arm bushings

C. A cracked coil spring sitting improperly on its seat

D. A failed strut upper mount bearing or mount plate

15. A technician notices that the engine oil on the dipstick has a strong gasoline odor. The oil level is above the full mark. Which of the following is the MOST likely cause?

A. Fuel is diluting the engine oil due to a rich running condition, leaking injector, or excessive shorttrip driving

B. The incorrect oil viscosity was used at the last oil change

C. The dipstick tube seal is leaking and drawing fuel vapor into the crankcase

D. Gasoline fumes from the fuel tank are migrating through the PCV system into the oil

16. A customer's vehicle has a whining noise that increases in pitch with vehicle speed. The noise is present in all gears, including Neutral when coasting. It disappears when the vehicle is stationary. Which of the following is the MOST likely source?

A. The automatic transmission torque converter

B. The engine water pump bearing

C. A worn wheel bearing, differential, or tire noise

D. The power steering pump under load

17. A vehicle's rear window defroster does not work. The indicator light on the switch illuminates when the button is pressed. A voltmeter shows battery voltage on both terminals of the defroster grid with the system turned on. What does this indicate?

A. The defroster timer relay has failed and is not supplying adequate current

B. An open (break) in the defroster grid element preventing current flow through the circuit

C. The defroster switch has an internal fault and is only passing voltage to the indicator

D. A faulty ground connection at the defroster grid is preventing circuit completion

18. A technician retrieves DTC P0128 (Coolant Thermostat — Coolant Temperature Below Thermostat Regulating Temperature). Which of the following is the MOST likely cause?

A. A thermostat that is stuck open or opens prematurely, preventing the engine from reaching operating temperature

B. A thermostat that is stuck closed, causing the engine to overheat

C. A faulty engine coolant temperature sensor reporting a value that is too high

D. A cooling fan relay that is stuck in the off position, preventing fan operation

19. Technician A says that a scan tool is required to bleed the ABS hydraulic control unit on some vehicles. Technician B says that a standard fourwheel manual bleed will always purge all air from any ABSequipped brake system. Who is correct?

A. Both Technician A and Technician B

B. Technician B only

C. Neither Technician A nor Technician B

D. Technician A only

20. A customer brings a vehicle in for an A/C performance check. The outside temperature is 95°F. The center vent discharge temperature is 55°F. Which of the following is the correct assessment?

A. The system is underperforming and requires refrigerant charge verification

B. The system is overcharged and the excess refrigerant must be recovered

C. The system is operating within an acceptable temperature range for the conditions

D. The evaporator core is icing over and the system must be diagnosed for a stuck expansion valve

21. A vehicle has an intermittent nostart condition that occurs only on hot days after the engine has been shut off for 20 to 30 minutes. The engine cranks normally but does not start. After cooling for an additional 30 minutes, it starts and runs fine. Which of the following is the MOST likely cause?

A. A heatsoaked component — such as a crankshaft position sensor, ignition module, or fuel pump — that fails when hot and recovers when cooled

B. A vaporlocked fuel system that pressurizes excessively during heat soak

C. A battery with reduced cold cranking amps that weakens in high ambient temperatures

D. A starter motor with heatexpanded brushes that intermittently lose contact with the commutator

22. A technician is checking for exhaust leaks on a vehicle that is not running. A shop vacuum is connected to the tailpipe set to blow mode. What additional method helps locate the leak?

A. Using a stethoscope to amplify the sound of escaping air

B. Applying soapy water to suspect areas and looking for bubbles

C. Spraying starting fluid around the exhaust joints and listening for RPM change

D. Using a thermal imaging camera to find temperature differences

23. A vehicle equipped with variable valve timing (VVT) has DTC P0011 (Camshaft Position — Timing OverAdvanced, Bank 1). All of the following are possible causes EXCEPT:

A. Incorrect engine oil viscosity that is too thick for the VVT solenoid

B. A clogged oil passage to the VVT actuator restricting oil flow

C. A faulty VVT control solenoid stuck in the advanced position

D. A worn timing chain that has stretched beyond its service limit

24. Technician A says that tire rotation should be performed at the mileage interval specified by the vehicle or tire manufacturer. Technician B says tire rotation is only necessary when uneven wear becomes visible. 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

25. A vehicle has a vibration felt only in the brake pedal at highway speed that was not present before a recent front brake job. The rotors are new and the pads are correctly installed. Which of the following is the MOST likely cause?

A. Brake pad material that is incompatible with the new rotor metallurgy

B. Brake caliper mounting bracket bolts that were not torqued to specification

C. Excessive rotor lateral runout caused by debris or corrosion between the rotor and hub mounting surface

D. New brake pads that have not yet been properly bedded in

26. A technician is testing a fuel injector's resistance with a DMM. The specification is 12–16 ohms. The meter reads OL (over limit). What does this indicate?

A. The injector coil winding is shorted, drawing excessive current

B. The injector coil has an open circuit and is not functional

C. The injector resistance is within the normal operating range

D. The DMM leads are reversed and the reading is invalid

27. A customer states the vehicle's A/C only blows cold intermittently — it cycles between cold air and warm air every few minutes. The refrigerant charge is correct. Which of the following is the MOST likely cause?

A. A faulty blower motor resistor changing fan speeds erratically

B. A contaminated cabin air filter reducing airflow across the evaporator

C. A sticking A/C compressor clutch coil with intermittent engagement

D. A freezing evaporator core caused by a malfunctioning thermistor or pressure cycling switch

28. A technician is performing a voltage drop test on a starter motor circuit. The test is performed with the circuit under load (during cranking). Why must the circuit be under load for this test to be valid?

A. Voltage drop only occurs when current is flowing through resistance; with no current flow, there is no drop to measure

B. The battery must be loaded to verify its internal resistance independently of the starter circuit

C. The starter motor requires a load test to verify its internal winding resistance

D. Voltage drop readings are only accurate when measured at the alternator's regulated output

29. A customer complains of a sulfur or "rotten egg" smell from the exhaust. There are no DTCs and the engine runs normally. Which of the following is the MOST likely cause?

A. A leaking exhaust gasket between the manifold and the catalytic converter

B. A contaminated engine oil that is burning in the crankcase and venting through the PCV system

C. A small amount of hydrogen sulfide produced by the catalytic converter, often caused by high sulfur content fuel or a slightly rich fuel condition

D. A deteriorating exhaust flex pipe releasing trapped moisture and sulfur deposits

30. A technician is inspecting a drive belt automatic tensioner. The tensioner arm moves freely through its full range of motion and does not snap back. What does this indicate?

A. The tensioner is operating normally and maintaining proper belt tension

B. The belt is oversized and reducing tension on the spring mechanism

C. The tensioner mounting bolt is loose, allowing the assembly to pivot

D. The internal spring has lost its tension and the tensioner must be replaced

31. A vehicle with a 4speed automatic transmission has a firm 1–2 shift but all other shifts are normal. The fluid is at the proper level and condition. Which of the following is the MOST likely cause?

A. A worn torque converter clutch causing slippage during the 1–2 shift

B. A sticking or malfunctioning shift solenoid or accumulator piston specific to the 1–2 shift circuit

C. A worn input shaft seal allowing pressure loss across all gear ranges

D. An incorrect throttle position sensor calibration affecting all shift quality

32. Technician A says that the OBD II data link connector (DLC) is always located under the dashboard on the driver's side of the vehicle. Technician B says the DLC can be located anywhere in the passenger compartment and there is no standardized location. 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

33. A vehicle has a coolant leak from the water pump weep hole. Which of the following is the correct interpretation?

A. A small amount of seepage from the weep hole is normal and does not indicate pump failure

B. The weep hole is clogged and needs to be cleared to prevent internal pressure buildup

C. The water pump internal shaft seal has failed, and the pump requires replacement

D. The weep hole drip is caused by excessive cooling system pressure from a faulty radiator cap

34. A vehicle's power door locks operate with the key fob but do not operate from the interior door lock switch on the driver's door. All other doors' interior switches work normally. Which of the following is the MOST likely cause?

A. A faulty body control module (BCM) that cannot process interior switch signals

B. A failed power lock actuator motor inside the driver's door

C. A blown fuse for the central locking system

D. A faulty driver's door lock switch or wiring in the driver's door harness

35. A vehicle pulls to the right consistently while driving on a flat, straight road. The tire pressures are correct and equal, and the front alignment has been verified as within specification. Which of the following should the technician check NEXT?

A. The front brake calipers for a sticking condition on one side

B. The rear alignment angles for a thrust angle that is not parallel to the vehicle centerline

C. The steering column for a binding intermediate shaft

D. The front stabilizer bar links for excessive play

36. A technician needs to test the operation of a cooling fan relay. Which of the following is the correct procedure?

A. Apply battery voltage to the relay control coil terminals and verify continuity changes across the load terminals with a DMM

B. Swap the relay with an identical one from an adjacent socket and see if the problem follows the relay

C. Measure the relay coil resistance and compare it to the relay housing specification label

D. Install a jumper wire across the relay load terminals in the fuse box and verify fan operation

37. A customer reports that the vehicle's cruise control will set but disengages on its own after a few minutes. There are no DTCs. All of the following could cause this EXCEPT:

A. A slightly misadjusted brake light switch that is intermittently signaling a brake application

B. An intermittent vehicle speed sensor signal dropping out momentarily

C. A vacuum leak at the cruise control servo or supply hose (on vacuumoperated systems)

D. A worn throttle cable with excessive free play

38. A technician is diagnosing a noheat complaint. The engine coolant temperature reaches 210°F on the scan tool. Both heater hoses are hot. The blower motor works on all speeds. Air from the vents is only lukewarm. Which of the following is the MOST likely cause?

A. A stuckopen thermostat not allowing the engine to reach full temperature

B. A restricted heater core that is limiting coolant flow volume

C. A blend door that is not moving to the full hot position

D. A failed heater control valve that is restricting coolant flow to the core

39. A vehicle owner asks whether wheel spacers are safe to install. Which of the following is the correct response?

A. Wheel spacers change the scrub radius, increase stress on wheel bearings and studs, and are generally not recommended unless they are hubcentric and approved for the specific application

B. Any bolton wheel spacer up to 2 inches is considered safe for street use

C. Wheel spacers only affect appearance and have no impact on suspension geometry or component wear

D. Wheel spacers are universally prohibited and installing them voids all vehicle warranties

40. A vehicle has a single loud pop or backfire from the exhaust on deceleration. This occurs occasionally when the driver releases the throttle from high RPM. There are no DTCs. Which of the following is the MOST likely cause?

A. A cracked exhaust manifold allowing air to enter the exhaust stream

B. A momentary lean condition during deceleration allowing unburned air and fuel to ignite in the hot exhaust

C. A faulty knock sensor that is not retarding timing during deceleration

D. A worn camshaft lobe that is altering valve timing during engine braking

41. A technician is replacing the accessory drive belt on a vehicle with a springloaded automatic tensioner. After installation, the belt chirps on startup and the noise goes away after a few seconds. Which of the following is the MOST likely cause?

A. The belt is routed incorrectly around one or more pulleys

B. The belt is the wrong width for the pulley grooves

C. The new belt requires a brief breakin period to seat in the pulleys

D. Residual moisture or a glazed pulley surface causing momentary slip until the belt warms up

42. A vehicle's exhaust system has a resonant droning noise between 1,800 and 2,200 RPM that disappears outside that range. There are no exhaust leaks. Which of the following is the MOST likely cause?

A. A cracked catalytic converter substrate rattling at specific frequencies

B. A failed exhaust hanger allowing the pipe to contact the undercarriage

C. A deteriorated or missing exhaust resonator or muffler baffle that has lost its soundcanceling properties

D. A loose heat shield on the catalytic converter vibrating at a resonant frequency

43. A technician discovers that a coolant hose has a soft, spongy section near one end while the rest of the hose feels firm. What is the correct action?

A. Replace the hose; internal deterioration has weakened the hose wall and it could rupture under pressure

B. Reinforce the soft area with a hose clamp to prevent expansion

C. The hose is still serviceable as long as there are no visible cracks or leaks

D. Rotate the hose 180 degrees to move the soft area away from the heat source

44. A vehicle with electronic throttle control (ETC) enters "limp home" mode and the engine will not rev above 2,500 RPM. The scan tool shows DTC P2135 (Throttle/Pedal Position Sensor Voltage Correlation). After clearing the code, the system returns to normal operation temporarily. What is the correct diagnostic step?

A. Replace the throttle body assembly immediately since the code will inevitably return

B. Inspect the throttle body connector, wiring harness, and TPS sensor signal voltages at the PCM for intermittent faults

C. Replace the accelerator pedal position sensor since it is the most common cause of P2135

D. Reprogram the PCM with updated software to recalibrate the throttle correlation tables

45. A vehicle's transmission fluid is being inspected during a service. The fluid is bright pink, has no burnt odor, and is at the correct level on the dipstick. However, the customer reports occasional soft or flared shifts. Which of the following should the technician investigate?

A. The transmission fluid, which is clearly contaminated despite its appearance

B. The transmission filter for restriction, since fluid condition does not indicate filter condition

C. The electrical inputs to the transmission control module, such as the throttle position sensor and vehicle speed sensor signals

D. The torque converter clutch for excessive slippage during all gear changes

46. A technician is using a scan tool to view O2 sensor data on a vehicle with a V6 engine. The Bank 1 upstream sensor shows a steady voltage of 0.45 volts that does not fluctuate. What does this indicate?

A. The sensor is operating normally at the stoichiometric set point

B. The sensor has a contaminated element but is still within operational limits

C. The engine is in openloop operation and the sensor is being ignored

D. The sensor has failed and is not actively responding to changes in exhaust oxygen content

47. A customer asks what causes the steering wheel to slowly return to center after making a turn. Which alignment angle is PRIMARILY responsible for this selfcentering action?

A. Positive caster

B. Negative camber

C. Toein

D. Steering axis inclination

48. A vehicle with a fourwheeldrive system makes a binding or tightturning sensation (crow hop) during slow, sharp turns on dry pavement while in 4WD High. The system operates normally on loose or wet surfaces. What is the correct explanation?

A. The front axle disconnect is not fully engaging, causing a partial lockup condition

B. This is a normal characteristic of a parttime 4WD system, which should not be used on dry pavement because the system lacks a center differential to accommodate tire speed differences

C. The front and rear differentials are out of phase and require a gear backlash adjustment

D. The transfer case fluid is contaminated and the clutch packs are grabbing intermittently

49. A technician is inspecting a battery that has a whitegreen powdery buildup on the positive battery terminal. Which of the following is the correct action?

A. Apply dielectric grease over the corrosion to seal it and prevent further buildup

B. Ignore the corrosion if the vehicle starts and charges normally

C. Replace the battery because terminal corrosion indicates a failing internal cell

D. Clean the terminal and cable end with a battery terminal brush and cleaning solution, then apply a corrosionpreventive compound after reconnecting

50. A technician retrieves DTC P0456 (EVAP Emission System — Very Small Leak Detected). The fuel cap has been verified as sealing correctly. Which of the following is the NEXT appropriate diagnostic step?

A. Replace the EVAP canister purge valve since it is the most common source of very small EVAP leaks

B. Replace all EVAP system hoses as a precautionary measure

C. Perform a smoke test on the EVAP system to visually locate the source of the small leak

D. Ignore the code since very small leaks are typically caused by temperature changes and will selfclear

51. A vehicle's highbeam headlights work, but the low beams on both sides do not illuminate. The lowbeam fuse is good. Which of the following is the MOST likely cause?

A. A failed multifunction (combination) switch or headlight dimmer switch controlling the lowbeam circuit

B. Both lowbeam bulbs have burned out simultaneously

C. A faulty headlight relay for the highbeam circuit sending power to the wrong filament

D. A grounding issue affecting only the lowbeam circuit path

52. A customer brings in a vehicle with a clunking noise from the rear when going over bumps. The noise occurs regardless of vehicle speed. Which of the following is the LEAST likely cause?

A. Worn rear shock absorber mounting bushings

B. A loose spare tire or jack assembly in the trunk

C. A broken rear coil spring

D. A worn rear axle pinion gear

53. Technician A says that DOT 5 silicone brake fluid can be used as a direct replacement for DOT 3 in any vehicle. Technician B says that DOT 5 silicone fluid is not compatible with ABS systems and should not be mixed with glycolbased fluids. 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 technician is performing a state emissions inspection. The vehicle's OBD II system shows a "Not Ready" status for the catalytic converter monitor and the EVAP monitor. All other monitors show "Ready." What is the correct action?

A. Fail the vehicle because any "Not Ready" monitor constitutes an automatic failure

B. Pass the vehicle because the majority of monitors have completed

C. Follow the statespecific regulations, which typically allow one or two monitors to be "Not Ready" on most OBD II vehicles and still pass

D. Instruct the customer to drive the vehicle for exactly 100 miles and return for retesting

55. A vehicle with a transponder key antitheft system starts and runs for 2–3 seconds, then immediately stalls. The engine restarts and stalls again each time. Which of the following is the MOST likely cause?

A. A flooded engine from a stuckopen fuel injector

B. An antitheft system that recognizes the key enough to allow cranking and initial start but then fails secondary authentication and cuts fuel or spark

C. A faulty idle air control valve that cannot maintain idle speed after startup

D. A clogged catalytic converter creating enough backpressure to stall the engine at idle

Practice Exam 4: Answer Key and Full Explanations

1. C — A clogged catalytic converter restricts exhaust flow equally across ALL cylinders, which would cause a general engine performance issue or a random misfire code (P0300), not a single-cylinder-specific misfire code like P0301. A fouled plug, leaking injector, or burned valve are all cylinder-specific faults that logically produce a misfire isolated to one cylinder. On EXCEPT questions, look for the answer that affects the entire engine rather than a single cylinder.

2. D — A brake fluid level at the minimum mark means fluid has gone somewhere — either it has leaked externally or the brake pads are severely worn (pushing caliper pistons out and displacing fluid into the calipers). Simply topping off the fluid masks the underlying problem and does not address a potentially dangerous leak or worn-out pads. The technician must inspect the entire brake system to identify the cause of fluid loss before adding fluid.

3. A — Positioning the lift arm pads on the manufacturer-specified lift points is the single most critical safety step before raising a vehicle. Placing pads on unibody seams, suspension components, or non-reinforced areas can cause the vehicle to slip off the lift, collapse body panels, or damage the vehicle — any of which can result in serious injury or death. Every vehicle has designated lift points identified in the service information.

4. B — Technician B is correct. Measuring resistance in an energized circuit produces inaccurate readings and can damage the DMM's ohmmeter function because the meter injects its own small test current to calculate resistance. External voltage from the circuit interferes with this measurement. The circuit must be powered off and the component ideally isolated (disconnected) to get a true resistance reading.

5. D — Leaking fuel injectors allow fuel to slowly drain from the pressurized fuel rail into the intake ports or cylinders during long shutdown periods. On the next cold start, the fuel system must rebuild pressure and the cylinders with pooled fuel run momentarily rich, causing rough running until the excess fuel clears and normal fuel control resumes. This is a classic cold-start roughness pattern that often produces no DTC because the issue self-corrects within the first few minutes.

6. A — With a good battery, proper charging system output, and an acceptable parasitic draw of 40 milliamps, the only remaining explanation is that the battery is not being sufficiently recharged during driving. Short trips of 10–15 minutes do not provide enough run time for the alternator to replace the energy used during engine cranking and initial startup loads. Over multiple days of short trips, the battery progressively discharges until it can no longer start the vehicle.

7. C — ABS-equipped vehicles have hydraulic control units with internal solenoid valves and passages that can trap air in locations that standard gravity or pedal bleeding cannot reach. Many manufacturers require a scan tool to activate the ABS solenoids during the bleed procedure to cycle fluid through the modulator and purge trapped air. Using a generic bleed procedure on an ABS vehicle can leave air in the modulator, resulting in a spongy pedal or ABS malfunction.

8. B — Jumping the relay socket and getting cold air proves that the compressor, clutch coil, and refrigerant charge are all functional. The fault lies in the control circuit that energizes the relay — this could be the relay itself, the low-pressure cutout switch (which disables the compressor when charge is borderline low), the high-pressure switch, a fuse, or the PCM command signal. The relay bypass test effectively isolates the problem to the control side of the circuit.

9. A — Play detected at the 12 and 6 o'clock positions (vertical) on a non-driven wheel indicates a worn wheel bearing or an improperly adjusted tapered roller bearing. A worn tie rod end produces play at the 3 and 9 o'clock positions (horizontal), and a worn ball joint typically produces play at 12 and 6 but also allows lateral movement. On non-driven wheels with serviceable bearings, checking and adjusting bearing preload is the first corrective step.

10. D — A delayed engagement specifically into reverse — with normal forward gear engagement — points to a hydraulic problem in the reverse apply circuit. Worn seals, a damaged piston, or a leaking servo in the reverse clutch pack allow hydraulic pressure to bleed off, and the clutch does not fully apply until enough pressure builds to overcome the leak. If the problem were line pressure or fluid level, all gears would be affected equally.

11. C — The technician has already confirmed battery voltage is present at the fuel pump connector, which means the fuel pump relay, fuse, and wiring up to the pump are all functioning. If the pump has power and ground but does not run, the pump motor itself has failed internally — typically from a burned-out armature, worn brushes, or seized bearings. A clogged filter or faulty regulator would not prevent the pump from running; they would only affect pressure or volume.

12. B — When tire balancing has been confirmed and a highway-speed steering wheel vibration persists, the next suspect is excessive lateral runout on a front brake rotor. Even a few thousandths of an inch of runout causes the rotor to push the brake pads back with each revolution, creating a pulsation that transmits through the steering system as a vibration. A dial indicator mounted on the steering knuckle and reading against the rotor face quantifies the runout.

13. B — A sulfated battery limits the current it can ACCEPT from the alternator during charging, but it does not limit the alternator's ability to PRODUCE current. Alternator output is determined by rotor speed, field current, and the electrical load on the system — not by the battery's internal condition. A slipping belt, worn brushes, and open diodes all directly reduce the alternator's ability to generate current, making the sulfated battery the least likely cause of low output.

14. D — The strut upper mount contains a bearing plate that allows the strut assembly to rotate with the steering while isolating road impacts from the vehicle body. When this bearing or the rubber mount plate deteriorates, it produces a knocking or clunking noise over bumps because the strut shaft moves within the failed mount. With the strut shaft nut already verified as tight, the mount itself is the next most probable source of the knock.

15. A — Fuel-diluted engine oil has a distinct gasoline odor and causes the oil level to read above the full mark because raw fuel is accumulating in the crankcase. Common causes include a rich fuel mixture from a stuck-open injector, a faulty fuel pressure regulator leaking fuel past its diaphragm into the intake vacuum line, or chronic short-trip driving where the engine never reaches full operating temperature to evaporate fuel from the oil. This condition dramatically reduces the oil's lubricating ability and must be corrected promptly.

16. C — A whining noise that varies with vehicle speed — not engine speed — and is present in all transmission gear positions including Neutral eliminates the transmission, torque converter, and engine-driven accessories as sources. The noise is tied to wheel rotation speed, which narrows the cause to components that turn with the wheels: wheel bearings, differential gears, or tire noise from irregular wear patterns. Road-testing at various speeds and on different surfaces helps isolate which component is responsible.

17. B — In a functioning defroster circuit, current flows from the supply terminal, through the resistive grid element, and out the ground terminal — creating a voltage drop across the grid. If battery voltage is present at BOTH terminals, no current is flowing because the circuit is open. An open break in the grid element (a cracked or damaged heater line on the glass) prevents current flow, and without current, no heat is generated. Grid repair kits or conductive paint can restore continuity across small breaks.

18. A — DTC P0128 specifically indicates that the engine is not reaching its expected operating temperature within a defined period after startup. This is the textbook definition of a thermostat that is stuck open or opening prematurely — coolant circulates through the radiator too early, and the engine cannot warm up to its designed temperature. A stuck-closed thermostat would cause overheating, not under-temperature operation.

19. D — Technician A is correct: many ABS systems have internal solenoid valves and passages inside the hydraulic control unit that trap air in locations conventional bleeding cannot reach, requiring a scan tool to cycle the solenoids during the bleed procedure. Technician B is incorrect: a standard manual four-wheel bleed does NOT always purge air from every ABS system — some designs absolutely require scan tool-assisted bleeding to achieve a firm pedal.

20. C — A center vent discharge temperature of 55°F with a 95°F ambient temperature represents a temperature drop of approximately 40°F, which falls within the generally accepted performance range of 35–45°F below ambient for a properly functioning A/C system. No further action or refrigerant adjustment is needed. A system that is underperforming would typically show vent temperatures above 65°F in these conditions.

21. A — An intermittent no-start that correlates specifically with high underhood temperatures during a hot soak period — and recovers after the engine compartment cools — is the classic signature of a heat-sensitive electronic component. Crankshaft position sensors, ignition modules, and fuel pump relays are the most common culprits because their internal semiconductor junctions can open or drift out of operating range when exposed to radiant heat from a recently shut-down engine. Testing the suspected component when the fault is active (hot) is essential for diagnosis.

22. B — Applying soapy water to exhaust joints, gaskets, and welds while air is being forced through the exhaust system from a shop vacuum causes visible bubbles to form at any leak point. This method provides a precise visual indication of the leak location and is more reliable than listening alone, especially on vehicles with multiple potential leak points. It works on the same principle as using soapy water to find a tire leak.

23. D — A worn, stretched timing chain causes the camshaft timing to RETARD (fall behind) relative to the crankshaft — not advance. DTC P0011 specifically indicates OVER-ADVANCED timing, meaning the camshaft is ahead of its commanded position. A stretched chain would set a retarded timing code (such as P0012), not an advanced timing code. Incorrect oil viscosity, clogged oil passages, and a stuck VVT solenoid can all cause over-advanced timing by affecting the hydraulic positioning of the VVT actuator.

24. A — Technician A is correct: tire rotation should be performed at the manufacturer's recommended mileage intervals (typically every 5,000–7,500 miles) as preventive maintenance to promote even wear across all four tires. Technician B is incorrect: waiting until uneven wear is visible means the damage is already done — the purpose of regular rotation is to prevent uneven wear from developing in the first place. By the time you can see it, tire life has already been reduced.

25. C — When new rotors are installed over a hub surface that has rust, debris, or corrosion buildup, the rotor cannot seat flat against the hub face. Even a few thousandths of an inch of contamination between the rotor hat and the hub flange induces lateral runout that was not present when the rotor was manufactured. This runout causes the rotor to wobble as it spins, creating a pulsation felt in the brake pedal. Cleaning the hub mounting surface to bare metal before rotor installation prevents this problem entirely.

26. B — An OL (over limit) reading on a DMM set to the ohms scale means the meter cannot measure any continuity through the component — the resistance is infinitely high, indicating an open circuit. In a fuel injector, this means the internal coil winding has broken and the injector cannot be energized electrically. A shorted coil would read near zero ohms, not OL. The injector must be replaced.

27. D — Intermittent cycling between cold and warm A/C output with a correct refrigerant charge indicates the evaporator is periodically freezing over, blocking airflow, and then thawing — repeating in a cycle. The evaporator thermistor (temperature sensor) or pressure cycling switch that normally prevents freeze-up has malfunctioned, allowing the evaporator surface to drop below 32°F. When ice forms on the evaporator fins, it blocks airflow and warm air exits the vents until the ice melts and the cycle repeats.

28. A — Voltage drop is the measurement of voltage lost across a resistance while current is flowing through it — it is a direct application of Ohm's Law ($V = I \times R$). With no current flowing, there is no voltage consumed by resistance, and the meter reads zero even if significant resistance exists in the circuit. This is why voltage drop tests must be performed under load: cranking the starter forces high current through the cables and connections, making even small resistances produce a measurable and meaningful voltage drop.

29. C — The "rotten egg" (hydrogen sulfide) smell from the exhaust is produced when the catalytic converter processes sulfur compounds present in the fuel. All gasoline contains some sulfur, and a slightly rich fuel mixture increases the amount of hydrogen sulfide generated during the catalytic reduction process. The smell is usually more noticeable with fuels that have higher sulfur content. It is typically not a sign of a major malfunction, but persistent odor may warrant checking fuel trim values for a mild rich bias.

30. D — An automatic belt tensioner relies on an internal spring to maintain constant pressure on the serpentine belt. If the tensioner arm moves freely and does not snap back to its loaded position, the internal spring has broken or lost its tension entirely. Without spring pressure, the tensioner cannot maintain belt tension, and the belt will slip on the pulleys — causing squealing, accessory underperformance, and potential belt derailment. The entire tensioner assembly must be replaced.

31. B — A shift quality problem isolated to a single gear change — firm 1–2 with normal 2–3, 3–4, and TCC operation — points to a component specific to that shift circuit. Each shift is controlled by a dedicated combination of solenoids, accumulators, and clutch apply circuits. A sticking accumulator piston or malfunctioning shift solenoid in the 1–2 circuit causes abnormal pressure application during that specific shift. System-wide issues like TPS calibration or fluid level would affect all shifts, not just one.

32. A — Technician A is correct. Federal OBD II regulations (SAE J1962) require that the DLC be located in the driver's side footwell area, within reach of the driver while seated, and accessible without the use of tools. While the exact position varies slightly by manufacturer (some mount it left of the steering column, some mount it right of center), it must be under the driver's side dash. Technician B's claim that it can be anywhere in the passenger compartment is incorrect.

33. C — The weep hole on a water pump is a designed drainage point located between the bearing seal and the coolant seal. When coolant drips from the weep hole, it indicates that the internal shaft seal has failed and coolant is bypassing the seal and reaching the bearing cavity. The weep hole prevents this coolant from contaminating the bearing grease. Any coolant drip from the weep hole — beyond initial moisture residue on a new pump — means the pump seal has failed and the pump requires replacement.

34. D — Since the key fob operates all the locks (proving the actuators and BCM are functional) and all other doors' interior switches work (proving the fuse, BCM input processing, and wiring backbone are good), the fault is isolated to the driver's door switch or the wiring between that switch and the BCM. A faulty switch with worn contacts or a broken wire in the driver's door harness — commonly at the door hinge flex point — would explain why only that one input fails.

35. B — With correct tire pressures and a verified front alignment, a consistent pull can be caused by a rear thrust angle that is not aligned with the vehicle's geometric centerline. The thrust angle is created by the rear axle or rear toe settings and determines the direction the rear of the vehicle pushes the front. If the thrust angle points to the left of center, the front of the vehicle is pushed to the right, creating a rightward pull that no amount of front alignment correction can fix.

36. A — The definitive bench test for a relay is applying battery voltage (and ground) to the control coil terminals to energize the relay, then using a DMM to check for continuity across the load terminals. When the coil is energized, the internal contacts should close and the meter should read near-zero ohms across the load terminals. When de-energized, the load terminals should read OL (open). This confirms both the coil and the contacts are functional. Swapping relays (option B) is a useful shortcut but does not definitively test the relay's operation.

37. D — A worn throttle cable with excessive free play would affect throttle response and feel, but it would NOT cause the cruise control to disengage after setting. Cruise control disengagement is triggered by specific signals: brake switch activation, loss of vehicle speed signal, or loss of vacuum to the servo. A misadjusted brake switch, intermittent VSS dropout, and a vacuum leak all directly interrupt the conditions the cruise module requires to maintain set speed.

38. C — The scan tool shows the engine is at full operating temperature (210°F), both heater hoses are hot (confirming coolant flow through the core), and the blower motor operates on all speeds. With the heat source confirmed and the air delivery system working, the only remaining component between the hot heater core and the passenger is the blend door. If the blend door is stuck in a partially open or closed position, it mixes cold bypass air with heated air, producing only lukewarm output regardless of the temperature setting.

39. A — Wheel spacers push the wheel and tire assembly outward from the hub, which increases the scrub radius (the lever arm between the steering axis and the tire contact patch) and the moment arm on the wheel bearings, studs, and suspension components. This increased leverage accelerates bearing wear, increases stress on wheel studs, and can alter steering feel and stability. Hub-centric, application-specific spacers with proper hardware are the only relatively safe option; universal spacers are not recommended.

40. B — During aggressive deceleration from high RPM, the throttle closes rapidly while the engine is still spinning at high speed, momentarily creating a very lean air-fuel mixture in the cylinders. If unburned lean mixture or residual air-fuel vapor reaches the hot exhaust system — particularly near the catalytic converter — it can ignite, producing a single sharp backfire or pop. This is a common and usually benign occurrence on vehicles with aftermarket exhaust systems or slightly worn injectors.

41. D — A brief chirp on startup that disappears within seconds is typically caused by moisture condensation on the belt or pulley surfaces from overnight temperature changes, or a slightly glazed pulley surface that creates momentary slip until the belt heats up and friction increases. This is a common and benign condition, especially in humid climates or after rain. An incorrectly routed belt (option A) would chirp or squeal continuously, not just for a few seconds.

42. C — A droning noise that occurs within a specific RPM range and disappears outside that range is a resonance issue — the exhaust system is amplifying sound at a particular frequency instead of canceling it. The resonator and muffler baffles are specifically designed to cancel certain sound frequencies. When internal baffles deteriorate, collapse, or separate, they lose their sound-canceling properties, and the affected frequency range produces an audible drone inside the vehicle.

43. A — A soft, spongy section in a coolant hose indicates that the inner reinforcement layers have deteriorated due to heat, chemical attack, or age — a condition called electrochemical degradation (ECD). The hose may look intact externally, but the weakened inner wall can balloon under pressure, restrict flow with internal delamination, or rupture without warning. Any hose with a localized soft spot has failed internally and must be replaced immediately.

44. B — DTC P2135 indicates a voltage correlation error between redundant throttle position sensor signals. Since the code clears and the system returns to normal temporarily, the fault is intermittent — which strongly suggests a wiring or connector issue rather than a completely failed sensor. Inspecting the throttle body connector for backed-out pins, corroded terminals, or chafed wiring, and monitoring live TPS voltages for signal dropout, targets the most common cause of intermittent correlation codes.

45. C — Bright pink, odor-free transmission fluid at the correct level eliminates fluid condition, level, and contamination as causes. Soft or flared shifts are typically caused by incorrect electronic signals TO the transmission, not problems inside it. The throttle position sensor tells the TCM how much engine load is present, and the vehicle speed sensor provides speed data — both directly influence shift timing and firmness. Incorrect or erratic signals from either sensor cause the TCM to command inappropriate shift pressure and timing.

46. D — A properly functioning upstream O2 sensor in closed-loop operation should constantly oscillate between approximately 0.1V (lean) and 0.9V (rich) several times per second as the PCM adjusts the fuel mixture. A steady, unmoving 0.45V indicates the sensor is producing a flat mid-range voltage and is NOT responding to actual changes in exhaust oxygen content. The 0.45V value is often the sensor's bias voltage or default state when the element has failed, become contaminated, or lost its internal heater function.

47. A — Positive caster is the alignment angle primarily responsible for steering wheel returnability (self-centering). Caster tilts the steering axis so that the tire contact patch trails behind the steering pivot point — much like a shopping cart caster. This trail creates a self-correcting force that pulls the steering wheel back to center after a turn is completed. More positive caster creates stronger returnability; insufficient caster makes the steering feel vague and reluctant to self-center.

48. B — Part-time four-wheel-drive systems lock the front and rear driveshafts together at a 1:1 ratio with no center differential to allow speed variation between axles. On dry pavement, the front and rear tires must travel at slightly different speeds during turns (the front tires travel a longer arc), but the locked system cannot accommodate this difference. The resulting drivetrain wind-up produces the characteristic binding, hopping, and skipping sensation called crow hop. This is by design — part-time 4WD is intended only for loose or slippery surfaces.

49. D — Battery terminal corrosion creates resistance that impedes current flow for both starting and charging, leading to hard starts, dim lights, and undercharging. The correct repair is to disconnect the cables, clean both the terminal posts and cable clamps with a terminal brush and a baking soda/water solution (or commercial cleaner), rinse and dry, reconnect and tighten, and apply a corrosion-preventive spray or felt washers to inhibit future buildup. Sealing over existing corrosion or ignoring it allows the problem to worsen.

50. C — With the fuel cap verified as sealing correctly, the next step for a P0456 very small EVAP leak is a smoke test. A smoke machine introduces visible smoke vapor into the sealed EVAP system under low pressure, and the technician visually inspects every hose, connection, valve, and canister for smoke escaping. This method can detect leaks far too small to find by visual inspection alone and is the industry-standard approach for all EVAP leak diagnosis.

51. A — Both low-beam bulbs burning out simultaneously is statistically unlikely, and the fuse is confirmed good, which eliminates a simple overcurrent fault. The component common to both low-beam circuits is the headlight switch (multifunction/combination switch) or the dimmer switch that routes power specifically to the low-beam relay or directly to the low-beam filaments. If the switch fails in the position that controls low beams, both sides lose power while the high-beam circuit — controlled by a separate contact within the same switch — continues to function.

52. D — A worn rear axle pinion gear produces a whining or howling noise that varies with vehicle speed and changes character between acceleration, deceleration, and coast — it does NOT typically produce a clunking noise over bumps. Clunking over bumps is a suspension-related symptom caused by loose or worn components that shift under impact loading. Worn shock mounts, broken springs, and loose cargo all produce bump-related clunks, making the pinion gear the least likely cause of this specific complaint.

53. B — Technician B is correct. DOT 5 silicone brake fluid is NOT compatible with ABS systems because its compressibility characteristics and aeration tendency under the rapid high-pressure cycling of ABS solenoid valves cause spongy pedal feel and degraded ABS performance. Additionally, DOT 5 must never be mixed with glycol-based fluids (DOT 3, 4, or 5.1) because the two chemistries are immiscible and will gel, causing complete brake system failure. Technician A is incorrect in stating it can be used as a direct replacement in any vehicle.

54. C — OBD II readiness monitor requirements vary by state and model year, but most state emissions programs allow one or two monitors to be in "Not Ready" status and still pass the inspection. This accommodation exists because some monitors require very specific driving conditions (drive cycles) to complete, and it is unreasonable to fail a vehicle solely because a monitor has not yet run. The technician should follow their specific state's regulations rather than making a blanket pass or fail decision.

55. B — A vehicle that cranks, starts, runs for 2–3 seconds, and then stalls repeatedly is exhibiting the classic behavior of a partial anti-theft authentication failure. The system recognizes the key well enough to allow the starter to engage and the engine to fire initially, but when the immobilizer controller performs its secondary verification (a more thorough transponder interrogation), authentication fails and the system cuts fuel injector pulse or ignition. This start-and-stall cycle repeats identically each attempt because the authentication failure is consistent.