

PRACTICE EXAM 12: ASE G1 SIMULATION — 55 QUESTIONS

1. A technician is inspecting a tire sidewall and finds the following DOT code stamped on the tire: DOT XXXX XXXX 2519. What does "2519" indicate?

- A. The tire was manufactured in the 19th week of 2025
- B. The tire has a maximum load rating index of 2,519 pounds
- C. The tire's production batch was the 25th run of the 2019 fiscal quarter
- D. The tire was manufactured in the 25th week of 2019 — the first two digits indicate the week and the last two indicate the year of manufacture

2. A vehicle's water pump is driven by the timing belt. The timing belt is due for replacement at 90,000 miles. The water pump shows no signs of leaking and operates normally at 88,000 miles. Which of the following is the correct recommendation?

- A. Replace the timing belt only and leave the water pump in service until it shows signs of failure
- B. Replace the water pump at the same time as the timing belt — the labor to access both components overlaps significantly, and a water pump failure after the belt service would require the same extensive disassembly again
- C. Replace the water pump now and delay the timing belt for another 10,000 miles
- D. Neither component needs replacement since neither has failed

3. A vehicle's A/C system uses a variable displacement compressor. The customer complains that the A/C output is lukewarm. Unlike a cycling-clutch system, this compressor runs continuously. The scan tool shows the compressor is commanded ON and the control valve is receiving the correct signal. Which of the following is the MOST likely cause?

A. A faulty compressor control valve (displacement solenoid) that is stuck in the minimum displacement position, preventing the compressor from increasing its pumping capacity — the compressor runs but barely moves refrigerant

B. A low refrigerant charge that has triggered the low-pressure cutout switch

C. A seized compressor bearing that prevents rotation

D. A slipping compressor clutch that cannot engage

4. A technician is evacuating an A/C system before recharging. The vacuum pump has been running for 15 minutes and the gauge shows 29.92 inches of mercury (near-perfect vacuum). The service information requires a minimum evacuation time of 30 minutes. Why must the technician continue evacuating even though a deep vacuum has been achieved?

A. The additional time is needed to remove residual refrigerant oil from the system

B. Continued evacuation is unnecessary once full vacuum is achieved — the time requirement is outdated

C. The vacuum pump needs the additional time to cool down and prevent overheating

D. Achieving vacuum removes air, but the continued evacuation time is needed to boil off and remove moisture trapped in the system — moisture boils at a lower temperature under vacuum, and adequate time ensures all moisture is vaporized and removed before charging

5. A vehicle equipped with a 48-volt mild hybrid system has a "belt-integrated starter generator" (BISG). The customer asks what the orange warning label on the 48V battery means. Which of the following is the correct explanation?

A. The 48V system operates at a voltage level that, while not as dangerous as a full hybrid's 300+ volt system, still requires awareness — the orange labeling identifies components that are above the standard 12V system and should not be serviced without consulting the manufacturer's specific safety procedures

B. The orange label indicates the battery is recyclable and should be returned to the dealer

C. The 48V system is identical to the 12V system and the orange label is purely decorative

D. The orange label means the battery is fully charged and ready for service

6. A technician performs a fuel pressure hold test. With the engine off and the fuel pump primed, the pressure gauge reads 58 psi. After 20 minutes with the pump off, the pressure has dropped to 15 psi. The specification states that pressure should not drop more than 5 psi in 20 minutes. Which of the following components could cause this excessive pressure loss?

A. A clogged fuel filter that restricts flow during operation

B. A faulty MAF sensor that over-reports airflow volume

C. A weak fuel pump that cannot generate adequate pressure during operation

D. A leaking fuel injector, a fuel pressure regulator with a ruptured diaphragm, or a faulty fuel pump check valve — any component that allows fuel to bleed from the pressurized rail back to the tank or into the intake manifold

7. Technician A says that a brake caliper guide pin boot that is torn should be replaced because it allows moisture and debris to enter the pin bore. Technician B says a torn boot has no effect on brake operation since the pin is stainless steel and cannot corrode. Who is correct?

A. Technician B only

B. Technician A only — even stainless steel pins can seize in their bores when road debris, water, and corrosion byproducts from the bracket bore accumulate around the pin; a torn boot allows contamination that causes the pin to stick, preventing the caliper from floating and causing uneven pad wear

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

8. A vehicle with an electronic thermostat (controlled by the PCM) has an engine that is running cooler than normal. The scan tool shows the PCM is commanding the thermostat to the fully closed position, but the coolant temperature remains low. Which of the following is the MOST likely cause?

- A. The PCM has a software error that is commanding the wrong thermostat position
- B. The coolant temperature sensor is misreading the actual temperature
- C. The electronic thermostat is stuck open mechanically and is not responding to the PCM's closed command — despite receiving the correct electrical signal, the internal valve mechanism has failed in the open position
- D. The radiator fan is running continuously, overcooling the engine

9. A vehicle requires brake hardware replacement during a brake pad service. All of the following are included in a typical brake hardware kit EXCEPT:

- A. Anti-rattle clips that hold the pads in the caliper bracket
- B. Pad abutment shims that go between the pad ears and the bracket slides
- C. A replacement brake caliper piston and seal
- D. Stainless steel guide pin sleeves and new pin boots

10. A customer brings in a vehicle with a complaint that the headlights dim when the electric radiator fan cycles on at idle. The dimming is brief and occurs each time the fan activates. Which of the following is the correct interpretation?

- A. A brief, slight dimming when a high-current device activates is a normal electrical characteristic — the momentary current draw of the fan motor starting causes a brief voltage dip that is visible in the headlight brightness; this is not a fault unless the dimming is severe or prolonged
- B. The headlight circuit shares a ground with the fan motor, creating a direct voltage conflict
- C. The alternator is failing and cannot supply current to both circuits simultaneously
- D. The headlight bulbs are aged and have increased filament resistance that makes the dimming more noticeable

11. A vehicle's exhaust system has a secondary air injection (AIR) system. The check engine light is on with DTC P0411 (Secondary Air Injection System — Incorrect Flow Detected). Which of the following is the purpose of the AIR system?

- A. To supply additional air to the intake manifold for increased power during acceleration
- B. To provide fresh air to the cabin ventilation system when the outside air is polluted
- C. To recirculate exhaust gas back into the intake for NO_x reduction
- D. To inject fresh air into the exhaust manifold or catalytic converter during cold startup to accelerate catalyst light-off and reduce cold-start hydrocarbon and carbon monoxide emissions

12. A customer asks what a tire's speed rating means. The tire sidewall shows "225/45R17 94W." Which of the following correctly explains the "W" speed rating?

- A. "W" indicates the tire is designed for winter use only
- B. "W" indicates the tire is rated for sustained speeds up to 168 mph — speed ratings identify the maximum speed at which the tire can safely operate under its rated load; installing a tire with a lower speed rating than the original equipment may affect handling and is not recommended
- C. "W" stands for "wide" and indicates the tire has a wider-than-standard tread
- D. "W" indicates the tire's wet weather traction grade

13. A vehicle's battery has been tested with a conductance tester. The results show: rated CCA 650, measured CCA 640, state of charge 98%, state of health GOOD. The customer states the vehicle sometimes cranks slowly on cold mornings. Which of the following should the technician investigate NEXT?

- A. The starter circuit — battery cables, connections, starter motor, and ground paths — since the battery itself tests good; slow cranking with a good battery points to excessive resistance or a failing starter rather than a battery problem
- B. The battery, which should be replaced since the measured CCA is below the rated value

C. The alternator, which may not be fully charging the battery overnight

D. The engine oil viscosity, which may be too thick for cold-weather starting

14. A vehicle's transmission cooler is integrated into the radiator (tank-in-tank design). The technician notices the transmission fluid appears pink and milky. The engine coolant also appears discolored with an oily film. Which of the following is the MOST likely cause?

A. The transmission fluid and coolant were accidentally mixed during a service

B. Both the transmission fluid and coolant have exceeded their service life simultaneously

C. The engine oil cooler has failed and is contaminating both fluids

D. The internal transmission cooler inside the radiator has ruptured, allowing coolant and transmission fluid to cross-contaminate — coolant enters the transmission (damaging clutch packs) and transmission fluid enters the cooling system (degrading coolant hose and gasket materials)

15. A vehicle has an illuminated tire pressure warning light. The technician checks all four tires and finds them inflated to the correct specification. The spare tire is a full-size spare mounted underneath the vehicle. Which of the following is the MOST likely cause?

A. The TPMS module has malfunctioned and needs replacement

B. The spare tire has a TPMS sensor that is reporting low pressure — many vehicles monitor the spare tire as part of the TPMS system, and a spare that has lost pressure over time triggers the warning

C. The TPMS sensors need recalibration after the tires were last rotated

D. The ambient temperature has changed since the tires were last inflated, affecting all four readings equally

16. A technician is performing a running compression test on an engine. Unlike a standard cranking compression test, the running compression test is performed with the engine idling. A normal running compression reading is typically 60–90 psi at idle. One cylinder reads 25 psi while all others read 80 psi. Which of the following is the MOST likely cause of the low running compression reading?

- A. Worn piston rings that cannot maintain compression under the dynamic conditions of a running engine
- B. A faulty compression gauge that reads low when the engine is running
- C. The low reading is caused by a restricted exhaust slowing the piston on the exhaust stroke
- D. A burnt or leaking exhaust valve on that cylinder — running compression tests are especially sensitive to valve sealing issues because the test captures the dynamic interaction between intake and exhaust flow; a leaking exhaust valve allows compression to escape during the overlap period

17. A vehicle equipped with cylinder deactivation technology (Active Fuel Management/Multi-Displacement) has a rough idle and increased oil consumption. Scan tool data shows that cylinder deactivation is not engaging. Which of the following is a known issue with these systems?

- A. The lifter mechanisms that lock and unlock to deactivate cylinders can fail due to oil passage clogging, weak springs, or mechanical wear — stuck lifters cause rough running, misfires on deactivated cylinders, and can lead to increased oil consumption through damaged valve seals
- B. Cylinder deactivation systems never cause rough idle because the PCM seamlessly manages the transition
- C. Oil consumption on deactivation-equipped engines is always caused by the PCV system
- D. The rough idle is caused by spark plugs that are not designed for deactivation engines

18. A vehicle's wiper motor operates normally on all speeds, but the wipers do not return to the park (resting) position when turned off — they stop wherever they are in their sweep. Which of the following is the MOST likely cause?

- A. The wiper motor has failed internally and must be replaced completely
- B. The wiper park switch (internal cam-operated switch inside the wiper motor assembly) has failed — this switch directs current to the motor after the control switch is turned off, allowing the motor to complete its current sweep and stop at the park position
- C. The multifunction switch has a faulty wiper control contact

D. The wiper linkage has a bent crank arm that prevents full travel to the park position

19. A vehicle has a P0300 (Random/Multiple Cylinder Misfire) that occurs ONLY under heavy load — wide-open throttle during uphill acceleration. The engine idles smoothly and cruises normally. All ignition components have been verified functional. Which of the following is the MOST likely cause?

A. A faulty idle air control valve that cannot regulate airflow under load

B. A contaminated MAF sensor underreporting airflow at idle

C. A weak ignition coil that cannot produce adequate spark under low engine vacuum and high cylinder pressure

D. Insufficient fuel delivery under high demand — a weak fuel pump that maintains adequate pressure at idle and cruise but cannot deliver sufficient volume at wide-open throttle when all injectors are at maximum pulse width

20. Technician A says that a vehicle's SRS system performs a self-test each time the ignition is turned on, which is indicated by the airbag light illuminating for a few seconds and then turning off. Technician B says the SRS light staying on continuously after the self-test indicates the system has passed its diagnostic check and is armed. Who is correct?

A. Neither Technician A nor Technician B is fully correct as stated

B. Technician B only

C. Technician A only — the brief illumination followed by the light turning OFF indicates the system has completed its self-test and found no faults; Technician B is incorrect because a light that stays ON continuously means the self-test FAILED and a fault has been detected — the airbags may NOT deploy in a collision

D. Both Technician A and Technician B

21. A customer reports that the vehicle's fuel door release button on the dashboard does not open the fuel door. The fuel door can be opened manually by pressing on it from outside the vehicle. Which of the following is the MOST likely cause?

- A. The fuel door release actuator motor or solenoid has failed, or the cable connecting the actuator to the fuel door latch has broken — the manual override still works because it bypasses the actuator mechanism entirely
- B. The fuel filler cap is cross-threaded and preventing the door from opening electrically
- C. The fuel tank pressure sensor is preventing the door from opening as a safety feature
- D. The body control module has disabled the fuel door release due to a communication error

22. A vehicle's scan tool shows the engine coolant temperature at 195°F (within specification), but the temperature gauge on the dashboard reads in the cold zone. Which of the following is the MOST likely cause?

- A. The engine thermostat is stuck open, preventing the engine from reaching temperature
- B. The vehicle uses TWO separate coolant temperature sensors — one for the PCM (which reads correctly on the scan tool) and one for the dashboard gauge (which has failed or has a wiring issue) — the gauge sensor or its circuit is the fault
- C. The scan tool is more accurate than the gauge and the reading should be ignored
- D. The PCM is averaging the temperature over time, creating a higher reading than the actual temperature

23. A vehicle has a growling noise from the front of the engine that is proportional to engine RPM. The noise is present at all times and does not change with accessory load (A/C, steering, electrical). Removing the serpentine belt does NOT eliminate the noise. Which of the following is the MOST likely source?

- A. A failing idler pulley bearing
- B. A worn power steering pump bearing
- C. A slipping serpentine belt

D. A noise from a component driven by the timing belt or timing chain — since the noise persists with the serpentine belt removed, it originates from an internally driven component such as the timing chain, timing belt tensioner, water pump (if timing-belt-driven), or oil pump

24. A vehicle's rear brakes are adjusted by automatic self-adjusters that engage when the vehicle is driven in reverse and the brakes are applied. The customer reports that the rear brakes have low effectiveness and the parking brake requires excessive lever travel. The customer rarely drives in reverse. Which of the following is the correct action?

A. Inform the customer that they must periodically drive in reverse while lightly braking to allow the self-adjusters to activate

B. Replace the rear brake drums because they have worn beyond maximum diameter

C. Manually adjust the rear brake shoes to the correct clearance using the star wheel adjuster through the access hole in the backing plate, and verify the self-adjusters are functional — automatic adjusters cannot compensate if the vehicle is never driven under the conditions that activate them

D. Replace the rear brake shoes since the friction material has worn beyond adjustment range

25. A vehicle has a P0420 (Catalyst System Efficiency Below Threshold — Bank 1). The technician uses an infrared thermometer to measure the catalytic converter's inlet temperature at 600°F and outlet temperature at 550°F. On a healthy converter, what should the outlet-to-inlet temperature relationship be?

A. The outlet should be HIGHER than the inlet — a functioning converter generates heat through the exothermic chemical reaction of oxidizing HC and CO; the 550°F outlet being LOWER than the 600°F inlet confirms the converter is not generating enough reaction heat, supporting the P0420 diagnosis

B. The outlet should always be lower than the inlet on a functioning converter

C. The inlet and outlet should always read exactly the same temperature

D. Temperature measurement is not a valid method for evaluating catalytic converter function

26. A technician is replacing a hub-centric wheel on a vehicle. The replacement wheel has the correct bolt pattern but does not have a hub-centric ring and the center bore is larger than the hub. Which of the following is a potential concern?

- A. No concern — lug nuts center the wheel regardless of the center bore size
- B. The wheel may not be properly centered on the hub, causing a vibration even after balancing — hub-centric fitment ensures the wheel is concentric with the axle; a lug-centric-only mount relies on the lug nuts to center the wheel, which may not achieve the same precision
- C. The larger center bore will cause the wheel bearings to wear prematurely
- D. The vehicle's TPMS sensors will not function with a non-hub-centric wheel

27. A vehicle has a stumble and hesitation during acceleration from a stop. The problem occurs only when the engine is cold and disappears after 3–4 minutes of warm-up. There are no DTCs. Fuel pressure is within specification. Which of the following is the MOST likely cause?

- A. A weak ignition coil that loses output in cold temperatures
- B. Contaminated fuel with excessive water content
- C. A restricted exhaust that creates excessive backpressure only when the engine is cold
- D. A faulty engine coolant temperature (ECT) sensor or intake air temperature (IAT) sensor that is reporting an inaccurate temperature to the PCM during warm-up — the PCM uses these temperature readings to calculate the correct fuel enrichment for cold operation; an incorrect reading causes too much or too little fuel during the warm-up phase

28. A vehicle's A/C evaporator is suspected of leaking refrigerant. The evaporator is located deep inside the HVAC case behind the dashboard. External leak testing has found no other leaks. Which of the following is the MOST effective method to confirm an evaporator leak without disassembling the dashboard?

- A. Checking for refrigerant stains on the exterior of the HVAC case

B. Performing a system pressure test and watching for pressure decay over 24 hours

C. Inserting an electronic refrigerant leak detector probe into the evaporator condensate drain tube opening — any refrigerant escaping from the evaporator collects in the drain pan and is detectable at the drain tube outlet

D. Adding UV dye and checking the cabin air filter for fluorescent traces

29. A vehicle has a battery drain complaint. The technician performs a parasitic draw test and measures 350 milliamps with all doors closed and all modules asleep. The technician begins pulling fuses one at a time. After pulling 15 fuses, the draw has not changed. Which of the following is the MOST likely explanation?

A. The circuit causing the excessive draw is powered directly from the battery through an unfused or inline-fused circuit — not all circuits route through the underhood or interior fuse panels; direct battery feeds to aftermarket accessories (amplifiers, alarms, GPS trackers) or body-mounted inline fuses may bypass the standard fuse panels

B. The test equipment is malfunctioning and showing a false reading

C. The parasitic draw of 350 milliamps is within the normal range for this vehicle

D. The draw is from the alternator diodes and not from any fused circuit

30. A vehicle's engine has an oil leak at the oil filter adapter gasket (the plate between the oil filter and the engine block). The technician replaces the gasket, but the leak returns within 500 miles. Which of the following should the technician investigate?

A. The oil filter for a damaged anti-drain-back valve

B. The oil viscosity, which may be too thin for the gasket to seal

C. Whether the oil pressure relief valve is stuck, causing system pressure to exceed the gasket's sealing capacity

D. Whether the oil filter adapter plate or the engine block mating surface is warped, cracked, or damaged — a perfect new gasket cannot seal against a distorted surface; the adapter plate should be

checked for flatness and the mating surface inspected for corrosion or damage that prevents the gasket from seating uniformly

31. A vehicle has a vibration that occurs between 35 and 45 mph, disappears above and below that range, and is NOT affected by engine RPM — the vibration occurs at the same vehicle speed in any gear. Tire balance has been verified. Which of the following is the MOST likely cause?

A. An engine misfire that is RPM-dependent

B. A worn engine mount that resonates at specific engine speeds

C. A loose exhaust component vibrating at a specific frequency

D. A worn driveshaft center support bearing, an out-of-balance driveshaft, or a bent driveshaft — the vibration occurring at a specific VEHICLE SPEED (not engine RPM) and being independent of gear selection confirms the source rotates with vehicle speed, not engine speed, pointing to a driveshaft component

32. A customer's vehicle has a "shift lock override" slot near the gear selector. The customer asks when this would be used. Which of the following is the correct explanation?

A. The shift lock override is used to manually engage the parking pawl when the electronic park mechanism fails

B. The override is used to bypass the neutral safety switch for starting the engine in gear

C. The shift lock override allows the driver to move the gear selector out of Park when the vehicle cannot be started (dead battery or brake switch failure) — it mechanically releases the shift interlock solenoid so the transmission can be shifted to Neutral for towing or push-starting

D. The override forces the transmission into a lower gear for towing heavy loads

33. A vehicle has a P0441 (EVAP System — Incorrect Purge Flow Detected). The technician tests the purge solenoid valve with a scan tool bidirectional command and finds it opens and closes on command. Which of the following could still cause this code?

- A. A blockage in the hose between the purge solenoid and the intake manifold, or between the purge solenoid and the charcoal canister — the valve works electrically but the vapor flow path is restricted by carbon buildup, a kinked hose, or a plugged canister
- B. A faulty gas cap that is not sealing the tank
- C. A leaking fuel tank that is venting to atmosphere
- D. A cracked charcoal canister vent line that allows unfiltered air into the canister

34. Technician A says that when performing a brake job, the brake fluid level in the master cylinder should be checked BEFORE compressing the caliper pistons back into their bores. Technician B says that the fluid level is irrelevant when compressing the caliper pistons. Who is correct?

- A. Technician B only
- B. Neither Technician A nor Technician B
- C. Both Technician A and Technician B
- D. Technician A only — as caliper pistons are pushed back into their bores, they displace fluid back into the master cylinder reservoir; if the reservoir was topped off (or is already full because someone added fluid without checking pad wear), compressing the pistons causes the reservoir to overflow, spilling corrosive brake fluid onto painted surfaces and underhood components

35. A vehicle's engine has excessive oil consumption but no external leaks or visible blue exhaust smoke. The technician removes the PCV valve hose from the intake manifold while the engine is running. A significant amount of blue-white vapor exits the hose. Which of the following does this indicate?

- A. The PCV system is contaminated with coolant and needs to be flushed
- B. Excessive blowby is occurring — combustion gases and oil vapor are passing the piston rings into the crankcase in greater-than-normal quantities; the PCV system is venting this blowby to the intake as designed, but the volume indicates ring or bore wear; the catalytic converter may be masking the smoke at the tailpipe
- C. The PCV valve is stuck open, creating a vacuum leak

D. The oil filler cap is missing, causing a vacuum imbalance in the crankcase

36. A vehicle's ABS system has performed a self-test — the customer reports feeling a brief pulsation in the brake pedal immediately after starting the vehicle and beginning to drive. There are no warning lights. Which of the following is correct?

A. This pulsation indicates a warped brake rotor that is only noticeable at low speed

B. The brake master cylinder has a momentary internal bypass during cold operation

C. This is normal — many ABS systems perform an initialization self-test at low speed after each startup, momentarily activating the ABS pump and solenoids to verify function; the brief pedal pulsation is the feedback from this automated test cycle

D. A wheel speed sensor is sending an erratic signal during startup

37. A customer brings in a tire with a nail puncture in the shoulder area — the area where the tread meets the sidewall. The tire holds air and has 7/32nds of tread remaining. Which of the following is the correct recommendation?

A. The tire cannot be safely repaired — industry standards (RMA/USTMA) limit puncture repairs to the center tread area only; shoulder and sidewall punctures are in a flex zone where repair materials cannot maintain a reliable seal, and the structural integrity of the tire is compromised in this area

B. Repair the tire with a standard plug-patch combination from the inside

C. Repair the tire with an external plug only since the puncture is small

D. The tire can be repaired if the nail diameter is less than 1/4 inch

38. A vehicle's cooling fan operates in two modes: a low-speed mode for normal cooling and a high-speed mode for maximum cooling demand (A/C on at idle, high coolant temperature). The low-speed mode works, but the high-speed mode does not activate. Which of the following would NOT cause this condition?

- A. A failed high-speed fan relay
- B. An open circuit in the high-speed relay control wire from the PCM
- C. A faulty engine coolant temperature sensor that never reports a temperature high enough to trigger high-speed mode
- D. A burned-out low-speed fan motor resistor — the low-speed resistor is IN the low-speed circuit, not the high-speed circuit; if the low-speed mode works, the low-speed resistor is functioning and is irrelevant to the high-speed failure

39. A vehicle with electric power steering (EPS) has the power steering warning light illuminated. A scan tool reveals a DTC for the EPS motor current draw exceeding the maximum threshold. Which of the following is the MOST likely cause?

- A. The EPS control module software needs to be updated
- B. A mechanical binding in the steering system — a seized ball joint, a tight rack bearing, a dry intermediate shaft joint, or a lack of suspension lubrication is creating excessive mechanical resistance that forces the EPS motor to draw more current than its design limit to provide the requested assist
- C. The 12V battery voltage is too high, overdriving the EPS motor
- D. The steering angle sensor has lost its center calibration

40. A technician is preparing to paint-correct a vehicle's hood with a dual-action polisher. The vehicle has a clear coat finish. Before beginning, which of the following is important for the technician to verify?

- A. That the ambient shop temperature is between 50°F and 90°F for proper polishing compound performance
- B. That the vehicle has been washed within the last 24 hours
- C. This type of cosmetic paint correction is outside the scope of Maintenance and Light Repair work and should be referred to a body/paint specialist — an MLR technician should recognize the boundaries of their scope and recommend appropriate referrals rather than risk damaging the vehicle's finish

D. That the hood panel is aluminum and not steel, since polishing techniques differ

41. A vehicle's transmission "Tow/Haul" mode has been activated by the driver. Which of the following BEST describes how this mode changes transmission operation?

A. Tow/Haul mode raises shift points to higher RPM, firms up shift feel, and enables engine braking on deceleration by commanding downshifts — all of these changes reduce heat buildup, improve vehicle control when towing or hauling heavy loads, and prevent the transmission from hunting between gears on grades

B. Tow/Haul mode lowers shift points to reduce engine RPM and improve fuel economy while towing

C. Tow/Haul mode only changes the torque converter lockup strategy and has no effect on shift timing

D. Tow/Haul mode increases line pressure but does not change shift points

42. A vehicle equipped with run-flat tires has a customer complaint of a harsh, rough ride quality. The tires have adequate tread and proper inflation pressure. There is no TPMS warning. Which of the following is the correct explanation?

A. The TPMS system is faulty and reporting incorrect pressures

B. The vehicle's suspension has worn components that are amplifying the tire's firmness

C. Run-flat tires need a longer break-in period than conventional tires before they soften

D. Run-flat tires are constructed with reinforced, stiffer sidewalls that allow them to support the vehicle's weight when deflated — this inherently stiffer construction produces a firmer ride quality compared to conventional tires; this is a design characteristic, not a defect

43. A vehicle's engine has a rhythmic knocking noise at idle that disappears at higher RPM. The technician uses a stethoscope and identifies the noise source near the top of the engine at the rocker arm area. A scan tool shows no misfires. Which of the following is the MOST likely cause?

- A. A worn crankshaft main bearing
- B. A rocker arm with a worn contact pad or a rocker arm pivot that has excessive play — the worn contact area creates a tapping noise as the rocker follows the camshaft lobe; at higher RPM, oil pressure increases and the faster cycling reduces the audible gap, making the noise less perceptible
- C. A loose harmonic balancer
- D. A damaged flywheel ring gear

44. A vehicle's scan tool shows the transmission fluid temperature at 270°F during a test drive. The normal operating range is 160–200°F. Which of the following is the correct action?

- A. Continue driving since the transmission is designed to handle temperatures up to 300°F
- B. The reading is a scan tool error and should be ignored
- C. Stop driving immediately and allow the transmission to cool — sustained temperatures above 240°F cause rapid breakdown of transmission fluid, accelerated seal hardening, and clutch plate material degradation; every 20°F above 200°F cuts fluid life in half; the source of the overheating must be identified and corrected before further driving
- D. Shift the transmission to Neutral and rev the engine to circulate the fluid faster

45. A technician notices that one rear tire on a vehicle is wearing primarily on the inside edge. The other rear tire shows even wear. Front tires show normal wear. Which of the following is the MOST likely cause?

- A. Excessive negative camber on the affected rear wheel — the top of the tire is tilted inward, concentrating the vehicle's load on the inside tread edge; this can result from a bent rear suspension component, a shifted subframe, or a worn rear control arm bushing on that side only
- B. Low tire pressure on the affected tire
- C. An out-of-balance rear tire causing scuffing on the inside edge
- D. Excessive toe-out on the rear axle affecting only the inside-worn tire

46. A vehicle's cruise control maintains speed on flat roads but loses speed significantly on moderate inclines without disengaging. The engine produces normal power during manual acceleration. Which of the following is the MOST likely cause?

A. A faulty vehicle speed sensor that underreports the speed loss to the cruise module

B. The cruise control system responds more slowly than the driver's foot — a partially restricted throttle cable (on cable-operated systems), a slow-responding electronic throttle actuator, or a cruise control module with a degraded servo motor cannot open the throttle quickly or far enough to maintain set speed against the additional load of an incline

C. The torque converter clutch is locked during cruise operation, preventing the engine from reaching the RPM needed for the grade

D. The cruise control is operating at its maximum authority — it intentionally allows some speed loss on grades to prevent the engine from being overworked, and this is normal operation within a tolerance of ± 5 mph

47. A vehicle's battery keeps going dead. The technician finds an aftermarket amplifier installed in the trunk. The amplifier is wired directly to the battery with its own inline fuse. The amplifier has no remote turn-on wire connected — it stays on at all times. Which of the following is the correct repair?

A. Install a higher-capacity battery to handle the constant amplifier draw

B. Connect the amplifier's remote turn-on wire to a switched ignition source so the amplifier only powers on when the vehicle is running — this eliminates the constant parasitic draw while preserving the amplifier's function during driving

C. Install a battery disconnect switch that the customer must activate each time they park

D. Remove the amplifier entirely since aftermarket accessories always cause problems

48. A vehicle has a squealing noise from the front brakes that occurs ONLY during the first few brake applications of the day and then disappears for the rest of the day. The pads and rotors are within specification. Which of the following is the MOST likely cause?

- A. A worn brake pad wear indicator that makes contact only when the pads are cold and contracted
- B. Glazed brake rotors that need machining
- C. A thin layer of overnight moisture (surface rust) on the rotor friction surface that is scraped off by the brake pads during the first few applications — the resulting squealing disappears once the surface rust is removed and full pad-to-rotor contact is established
- D. A caliper that is sticking and only releases fully after warming up

49. A vehicle with a turbocharged engine has an unexplained loss of engine oil between changes but shows no external leaks or excessive exhaust smoke. The turbocharger appears to function normally. Which of the following is a possible hidden source of oil consumption?

- A. The engine's piston rings are worn, allowing oil to pass into the combustion chambers
- B. The turbocharger's internal oil seals may be leaking, allowing engine oil that lubricates the turbo bearings to seep into the compressor housing (intake side) or turbine housing (exhaust side) — oil entering the intake is burned during combustion, and oil entering the exhaust is consumed by the catalytic converter, both of which can occur without producing visible smoke at the tailpipe
- C. The oil is evaporating from the crankcase due to excessive engine temperature
- D. The oil filter is absorbing and retaining oil during each change, giving the appearance of consumption

50. A technician is testing a fuel injector using a scan tool bidirectional control. The technician commands the injector OFF while the engine is running. Which of the following is the expected result if the injector is functioning correctly?

- A. The engine RPM should drop and the affected cylinder should misfire — this confirms the injector WAS delivering fuel; if RPM does not change, the injector was already not contributing fuel to that cylinder, indicating it is stuck closed, electrically dead, or severely clogged
- B. The engine RPM should increase as fuel is removed from one cylinder
- C. No change should occur because the other cylinders compensate immediately
- D. The engine should stall if the injector is functioning

51. A vehicle's check engine light is on with DTC P0420. The vehicle has 120,000 miles and the catalytic converter is original. The customer asks if the vehicle is still safe to drive. Which of the following is the correct response?

- A. The vehicle should not be driven because a failing converter can catch fire
- B. The vehicle is safe to drive — a P0420 means the converter's efficiency has degraded below the OBD II threshold for emissions compliance, but it does not indicate a safety hazard; the vehicle will produce higher emissions and may fail an emissions test, but the brakes, steering, and other safety systems are unaffected by this code
- C. The vehicle must be towed to the nearest repair facility immediately
- D. The vehicle's fuel economy will drop so dramatically that driving it is not economically practical

52. A vehicle has a growling or humming noise from the rear that changes when the vehicle transitions from acceleration to deceleration (drive to coast). The noise pitch changes at the transition point. Which of the following is the MOST likely cause?

- A. Worn rear wheel bearings that change noise under load reversal
- B. Rear tire tread noise that changes with road surface
- C. Rear differential gear noise — the ring and pinion gears mesh differently under drive load versus coast load due to the gear tooth contact shifting from the drive side to the coast side; this distinctive drive-to-coast noise change is the signature characteristic of differential gear wear or improper gear mesh pattern
- D. A worn driveshaft U-joint producing a cyclic noise

53. A vehicle's power steering system uses a variable-assist strategy that provides maximum assist at low speed (parking) and reduces assist at high speed (highway driving). The customer complains that the steering feels too heavy at parking speed but is normal at highway speed. Which of the following is the MOST likely cause?

- A. The power steering pump has worn vanes that cannot produce adequate pressure at idle RPM

- B. The steering gear has excessive internal leakage that only affects low-speed operation
- C. The front tires are overinflated, creating excessive steering effort at all speeds
- D. The variable-assist control mechanism (vehicle speed-sensitive solenoid, electronic control valve, or EPS control module) has failed and is stuck in the high-speed (reduced assist) mode — it provides the correct reduced assist at highway speed but cannot increase assist when low-speed parking maneuvers demand it

54. A technician replaces all four brake rotors on a vehicle. After the repair, the customer returns stating the brakes vibrate and the steering wheel shakes during braking from highway speed. The rotors are verified to be the correct part number. Which of the following is the MOST likely cause?

- A. The hub mounting surfaces were not cleaned of rust and corrosion before installing the new rotors — contamination between the rotor hat and hub flange induces lateral runout that produces the pulsation and steering wheel shake; this is the most common cause of vibration complaints immediately after rotor installation
- B. The new rotors are defective with excessive thickness variation from the factory
- C. The brake pads are incompatible with the new rotor metallurgy
- D. The caliper pistons were not properly retracted before rotor installation

55. A vehicle equipped with a lane departure warning system displays a message: "Lane Departure System Unavailable." The road has clear lane markings and the weather is sunny. Which of the following is the MOST likely cause?

- A. The lane departure system requires a software update before it will function
- B. The forward-facing camera lens (typically mounted behind the windshield rearview mirror area) is obstructed by windshield haze, dirt, a sun shade, aftermarket tint strip, or dashboard reflection — the camera needs a clear optical path to detect lane markings, and any obstruction over the camera's field of view disables the system
- C. The lane departure system only functions above 40 mph and the vehicle is below that speed
- D. The GPS signal is too weak for the system to determine road geometry

Practice Exam 12: Answer Key and Full Explanations

1. D — The last four digits of the DOT code on a tire sidewall indicate the manufacturing date: the first two digits are the week (01–52) and the last two are the year. "2519" means the tire was produced in the 25th week (late June) of 2019. This date code is critical for determining tire age — most manufacturers and safety organizations recommend replacing tires older than 6–10 years regardless of tread depth, because rubber compounds degrade over time even when not in use.
2. B — On engines where the water pump is driven by the timing belt, accessing the water pump requires the same extensive disassembly as the timing belt — removal of covers, belt tensioners, and often engine mounts. If the water pump fails AFTER a timing belt replacement, the entire job must be repeated at full labor cost. Since the water pump is a wear item with a similar service life to the belt, replacing both during the same service interval is the universally accepted professional practice that saves the customer significant labor cost.
3. A — Unlike cycling-clutch compressors that turn on and off, variable displacement compressors run continuously and vary their pumping capacity through an internal control valve (wobble plate angle). When this control valve (displacement solenoid) fails in the minimum displacement position, the compressor spins but barely moves refrigerant — like a pump running with its output valve almost closed. The system produces weak cooling because insufficient refrigerant volume circulates through the evaporator despite the compressor appearing to operate normally.
4. D — Achieving a deep vacuum (removing air) happens relatively quickly, but removing moisture takes significantly longer. Water trapped in the system exists as liquid droplets in low points, absorbed in the desiccant, and as a film on metal surfaces. Under vacuum, water boils at a much lower temperature (approximately 70°F at 29.92 in. Hg vacuum), but it takes time for the heat in the metal components to vaporize all the moisture so the vacuum pump can extract it. The 30-minute minimum ensures adequate dehydration of the system.
5. A — The 48V mild hybrid system operates above the 12V "safe" threshold but below the lethal voltages of full hybrid systems (300–800V). While 48V is unlikely to cause a fatal shock under normal dry conditions, it can deliver significant current and produce dangerous arcing — especially around damaged components or in wet conditions. The orange labeling follows industry convention for identifying above-12V electrical components. Technicians should consult the manufacturer's safety procedures before servicing any orange-labeled component.

6. D — A fuel pressure hold test evaluates the system's ability to maintain residual pressure when the pump is off. Three components are responsible for maintaining this static pressure: the fuel pump check valve (prevents fuel from flowing backward to the tank), the fuel pressure regulator (prevents pressure from bleeding off through the return/regulation circuit), and the fuel injectors (must seal completely when not energized). A failure of any one of these components allows fuel to drain from the pressurized rail, causing extended cranking on the next start.

7. B — Technician A is correct. The guide pin boot's purpose is to seal the pin bore against road debris, water, salt, and sand. Even though the pin itself may be stainless steel, the caliper bracket bore where the pin slides is typically cast iron or aluminum — materials that corrode readily when exposed to moisture and contaminants. Once contamination enters through a torn boot, it packs around the pin and creates a binding condition that prevents the caliper from floating. A seized caliper causes uneven pad wear, brake pull, and accelerated rotor wear.

8. C — An electronic thermostat uses a heating element controlled by the PCM to regulate the wax pellet inside the thermostat, allowing the PCM to command the thermostat to open at different temperatures based on operating conditions. If the internal mechanical valve mechanism fails in the open position, coolant flows freely to the radiator regardless of the PCM's command — the electronic control is present but the mechanical output is stuck. The result is the same as a conventional thermostat stuck open: the engine runs below its designed operating temperature.

9. C — A brake hardware kit for a caliper/pad service includes the components that wear or deteriorate during pad life: anti-rattle clips (pad retention springs), abutment shims (slides that the pad ears rest on), guide pin boots and sleeves, and sometimes noise-dampening shims. A caliper piston and seal are NOT included — those are part of a caliper REBUILD kit, which is a separate, more comprehensive service. The distinction between a hardware kit and a rebuild kit is a common ASE question.

10. A — When a high-current device like a radiator fan motor (which can draw 30–40 amps) starts, the initial inrush current causes a momentary voltage dip across the entire electrical system. This dip is visible as a brief headlight dimming that lasts a fraction of a second before the alternator compensates. This is a normal electrical system characteristic on virtually all vehicles and does not indicate a fault — unless the dimming is severe (headlights nearly extinguish), prolonged (more than 1–2 seconds), or accompanied by other symptoms.

11. D — The secondary air injection system pumps fresh, oxygen-rich air into the exhaust manifold or directly upstream of the catalytic converter during cold engine startup. This additional oxygen serves two purposes: it helps the catalytic converter reach its light-off temperature (approximately 500°F) more quickly by promoting exothermic oxidation reactions, and it provides the oxygen needed to convert

cold-start hydrocarbon and carbon monoxide emissions into water and CO₂. The system typically operates only for the first 1–3 minutes after a cold start.

12. B — Tire speed ratings are an alphabetical scale that indicates the maximum sustained speed the tire is rated to handle safely under its maximum load capacity. "W" is rated for up to 168 mph (270 km/h). Common ratings include S (112 mph), T (118 mph), H (130 mph), V (149 mph), W (168 mph), and Y (186 mph). Installing a lower speed rating than original equipment can affect handling characteristics and heat dissipation at highway speeds and is not recommended by tire or vehicle manufacturers.

13. A — The battery conductance test shows the battery is essentially new-spec (640 measured vs. 650 rated, 98% SOC, "GOOD" health). Slow cranking with a healthy battery means the battery is delivering current, but something in the starter circuit is consuming it inefficiently. The cables, connections, ground straps, and starter motor itself are the remaining suspects. A voltage drop test on the starter circuit during cranking will pinpoint where the resistance exists — whether it's a corroded connection, a damaged cable, or a starter motor with worn brushes or bushings.

14. D — A tank-in-tank transmission cooler has a small internal radiator inside the end tank of the main radiator. When the internal barrier ruptures, the higher-pressure cooling system forces coolant into the transmission fluid, and transmission fluid migrates into the coolant. Coolant in the transmission is catastrophic — water attacks the clutch pack friction material, causing it to delaminate and fail. Transmission fluid in the coolant degrades rubber hoses and gaskets. Both the radiator and the transmission require service — often including a complete transmission rebuild.

15. B — Many vehicles equipped with direct TPMS include a sensor in the full-size spare tire. Over months or years of non-use, the spare's pressure drops through natural permeation while the road tires are maintained at proper pressure. The spare sensor detects the low pressure and triggers the TPMS warning light — and the driver has no idea it's the spare because they're checking the four visible tires. Checking and inflating the spare tire resolves the warning without any sensor or system repair.

16. C — A running compression test is performed at idle and measures the dynamic pressure in each cylinder while the valves are opening and closing at operating speed. Normal running compression is 60–90 psi — much lower than cranking compression because the intake valve is open for part of the test stroke. A cylinder reading 25 psi when all others read 80 psi has a significant sealing problem. Running compression tests are especially sensitive to exhaust valve leaks because a leaking exhaust valve allows compression to escape during the valve overlap period when both valves are briefly open.

17. A — Cylinder deactivation systems use special hydraulic lifters that can lock in the collapsed position, preventing the valves on deactivated cylinders from opening. These lifters rely on clean, properly pressurized oil flowing through narrow internal passages. When these passages clog with sludge or debris, or when the lifter's internal locking mechanism wears, the lifter can fail in either the locked or unlocked position — causing misfires, rough running, and valve seal damage that leads to increased oil consumption.

18. B — The wiper park switch is an internal mechanism (typically a cam and contact set) inside the wiper motor assembly that keeps the motor circuit energized after the driver turns the wipers off. This allows the motor to complete its current sweep and stop precisely at the park position before the circuit opens. When the park switch fails, the motor loses power the instant the driver switch is turned off — the wipers stop wherever they happen to be in their arc because there is no signal telling the motor to continue to the rest position.

19. D — A misfire that occurs ONLY under heavy load with all ignition components verified good points to a fuel delivery problem. At wide-open throttle, all injectors operate at maximum pulse width simultaneously, demanding peak fuel volume from the pump. A fuel pump with worn impellers or a weakening motor can maintain adequate pressure during low-demand conditions (idle, cruise) but cannot deliver sufficient volume when all injectors demand maximum fuel simultaneously. The fuel rail pressure drops, the mixture goes lean, and misfires occur across multiple cylinders.

20. C — Technician A is correct. The SRS airbag light illuminating briefly at startup and then turning off is the system's self-test confirmation — it has checked the crash sensors, inflator squibs, and control module circuits and found no faults. The system is armed and will deploy in a collision. Technician B is incorrect: a light that stays ON continuously after the self-test means a fault was detected — the system may NOT deploy when needed. A continuously lit SRS light is a safety concern that requires immediate diagnosis.

21. A — The fuel door release system is a simple mechanical or electromechanical mechanism: a button or switch commands a small motor, solenoid, or cable to release the fuel door latch. When the actuator fails or the cable breaks, the electrical/mechanical release path is interrupted. The manual override — usually a press-to-release mechanism on the door itself or a manual release handle in the trunk — is a separate mechanical path designed specifically to bypass the actuator when it fails, which is why it still works.

22. B — Many vehicles use separate coolant temperature sensors for the PCM and the dashboard gauge — they may be in different locations on the engine and have different resistance characteristics optimized for their specific function. When the scan tool (reading the PCM's sensor) shows 195°F but

the gauge reads cold, the PCM sensor is accurate and the gauge sensor or its circuit has failed. This dual-sensor design is frequently tested on the ASE exam because technicians who don't know about it may chase the wrong component.

23. D — The serpentine belt drives external accessories (alternator, P/S pump, A/C compressor, water pump on some engines). If the noise PERSISTS after the serpentine belt is removed, no external belt-driven component is the source. The remaining rotating components are those driven internally by the timing belt or timing chain: the camshaft(s), timing chain tensioner, timing belt idler, internally driven water pump, or oil pump. The noise source must be an internally driven component that continues to rotate whenever the engine runs.

24. C — Many rear drum brake self-adjusters are designed to activate during reverse braking — a mechanism inside the adjuster responds to the shoe movement pattern that occurs specifically when braking in reverse. If the vehicle is rarely driven in reverse (or rarely brakes in reverse), the adjusters never activate and the shoe-to-drum gap gradually increases as the shoes wear. Manually adjusting the star wheel adjuster through the backing plate access hole restores proper clearance immediately and should be followed by verifying the self-adjuster mechanism is functional.

25. A — A catalytic converter generates heat through exothermic chemical reactions — oxidizing HC and CO produces thermal energy. On a healthy converter, the outlet temperature is 50–100°F HIGHER than the inlet because the internal reactions are adding heat to the exhaust stream. When the outlet is LOWER than the inlet (550°F vs 600°F), the converter is not generating sufficient reaction heat, which confirms it has lost catalytic activity. This temperature differential test is a quick, non-invasive confirmation of P0420/P0430 diagnostic codes.

26. B — Hub-centric wheels use the center bore to precisely align the wheel concentrically with the hub and axle. Lug nuts then provide the clamping force. When a wheel has a larger center bore than the hub (lug-centric fitment), the lug nuts alone must center the wheel — and the conical lug seat may not achieve perfect concentricity. Even a few thousandths of an inch of eccentricity creates a vibration that cannot be corrected by tire balancing. Hub-centric rings fill the gap between the wheel bore and the hub, restoring precise centering.

27. D — During cold engine operation, the PCM commands a richer fuel mixture based on input from the ECT and IAT sensors. If either sensor reports an inaccurate temperature during the warm-up phase — reading warmer than actual (underenriching) or cooler than actual (overenriching) — the fuel mixture will be incorrect for the actual engine temperature. This causes hesitation (too lean) or rough running (too rich) until the engine reaches closed-loop operating temperature, at which point the O₂ sensor feedback corrects the mixture and the symptom disappears.

28. C — The evaporator sits inside a sealed HVAC case, and any refrigerant that leaks collects in the condensate drain pan below it. The condensate drain tube exits the case at the lowest point — typically accessible from the engine compartment firewall area. By inserting an electronic leak detector probe into this drain opening, the technician can sample the air in the evaporator drain area for refrigerant traces. This technique avoids the extensive dashboard disassembly required for visual evaporator inspection.

29. A — Not all vehicle circuits route through the standard underhood or interior fuse panels. Common unfused or independently fused circuits include aftermarket amplifier installations with dedicated inline fuses at the battery, alarm systems with direct battery connections, GPS tracking devices, dashcams with hardwired kits, and factory circuits like the starter motor or alternator field that connect directly to the battery. If pulling every fuse in both panels doesn't eliminate the draw, the technician must trace direct battery connections — especially aftermarket installations.

30. D — A new gasket seals by conforming to both mating surfaces under clamping pressure. If either surface is warped, pitted, corroded, or cracked, the gasket cannot make uniform contact across the entire sealing area — creating a gap that allows oil to leak past regardless of how new or correctly installed the gasket is. After a repeat leak with a known-good gasket, the mating surfaces must be inspected with a straight edge for flatness and examined for corrosion pits or casting defects.

31. D — A vibration that occurs at a specific VEHICLE SPEED regardless of which gear the transmission is in eliminates engine RPM as the variable. The driveshaft rotates at a speed proportional to vehicle speed, not engine speed. A worn center support bearing allows the driveshaft to wobble, an imbalanced driveshaft creates centrifugal force variation, and a bent driveshaft produces runout — all of which produce vibrations at the rotational speed of the shaft. The specific speed window (35–45 mph) represents the driveshaft's resonant frequency range.

32. C — The shift lock interlock is a safety mechanism that prevents the driver from shifting out of Park unless the brake pedal is pressed (proving the driver intends to move the vehicle). When the vehicle has a dead battery or a failed brake switch, the interlock solenoid cannot be energized through the normal circuit. The shift lock override provides a mechanical bypass — inserting a key or tool releases the solenoid manually, allowing the transmission to be shifted to Neutral for towing or to access the battery for jump-starting.

33. A — The purge solenoid has been verified electrically functional via scan tool bidirectional control. However, a working solenoid does not guarantee vapor flow — the plumbing between the solenoid and its connection points must also be clear. Carbon deposits from fuel vapors can accumulate in the hoses, the canister passages, or the purge valve ports over time, restricting vapor flow even though the valve

opens correctly. The PCM detects the insufficient purge flow rate and sets P0441 even with a functional solenoid.

34. D — This is a critical pre-service awareness step. When brake pads wear, the caliper pistons extend outward to maintain pad-to-rotor contact. The fluid displaced by the extended pistons comes from the master cylinder reservoir, lowering the reservoir level. If someone topped off the reservoir to compensate for the lower level (a common mistake), the reservoir is now overfull. Compressing the pistons during pad replacement forces all that fluid BACK into the already-full reservoir, causing it to overflow. Checking — and if necessary, removing excess fluid — before compressing the pistons prevents this.

35. B — The PCV system's job is to evacuate crankcase vapors (blowby) into the intake for re-burning. Some blowby is normal on any engine. However, a SIGNIFICANT volume of blue-white oil vapor exiting the PCV hose indicates excessive blowby — combustion gases are pushing past the piston rings in abnormal quantities, carrying oil mist with them. The catalytic converter oxidizes the oil vapor before it reaches the tailpipe, masking the visual blue smoke that would otherwise be visible. The oil consumption is real but hidden.

36. C — Many modern ABS systems perform an automated self-test during the first few seconds of driving after each startup. The ABS module briefly activates the hydraulic pump and cycles the solenoid valves to verify they respond correctly. The driver feels this as a brief pedal pulsation, kick, or grinding sensation — often accompanied by a quiet motor sound from under the hood. With no warning lights illuminated, this indicates the self-test completed successfully. This normal behavior is frequently reported as a "brake problem" by unfamiliar drivers.

37. A — Tire repair industry standards (RMA/USTMA, TIA) define a specific "repairable area" limited to the center of the tread — the area directly between the outermost tread grooves. The shoulder area (where the tread curves into the sidewall) flexes significantly during cornering and load changes, which prevents repair materials from maintaining a reliable seal. Additionally, the shoulder area has thinner rubber over the belt edges, and punctures in this zone often damage the internal belt structure. Shoulder and sidewall punctures require tire replacement.

38. D — On a two-speed fan system, the low-speed circuit uses a resistor (or relay-controlled reduced voltage path) to limit current and run the motor at reduced speed. The high-speed circuit bypasses the resistor entirely, sending full battery voltage to the motor through its own dedicated relay. These are independent circuits — a component failure in one does not affect the other. Since the low-speed mode works, the low-speed resistor is functioning and is NOT part of the high-speed circuit. The fault must be in the high-speed relay, its control wire, or its fuse.

39. B — The EPS motor is sized to provide steering assist within a defined current draw envelope. When the steering system has excessive mechanical resistance — from a seized ball joint, dry steering gear, binding intermediate shaft, or a suspension component that has tightened beyond specification — the motor must work harder and draw more current to overcome the resistance. The EPS module detects this overcurrent condition and illuminates the warning light to protect the motor from thermal damage. The root cause is mechanical, not electrical.

40. C — This question tests scope-of-practice awareness. Paint correction using machine polishers, compounds, and clear coat restoration is a specialized body shop and detailing skill set that falls outside the ASE G1 Maintenance and Light Repair scope. An improperly used dual-action polisher can burn through clear coat, create swirl marks, or damage base coat — all of which are expensive to repair. The MLR technician should recognize this boundary and refer the customer to a qualified paint/body professional.

41. A — Tow/Haul mode reprograms the transmission's shift schedule for heavy-load conditions. Higher shift points keep the engine in its power band longer, providing more torque for pulling or carrying weight. Firmer shifts reduce clutch slippage and heat generation. Downshift-on-deceleration provides engine braking on grades, reducing brake fade and wear. All these changes prevent the transmission from hunting between gears on inclines — a common and damaging behavior when towing without Tow/Haul mode.

42. D — Run-flat tires use reinforced sidewall construction (typically multiple layers of heat-resistant rubber compounds) that can support the vehicle's weight temporarily (usually 50 miles at 50 mph maximum) when all air pressure is lost. This structural reinforcement makes the sidewall inherently stiffer than a conventional tire of the same size. The stiffer sidewall transmits more road surface irregularities into the suspension and cabin, producing the firmer, harsher ride that is a trade-off for the run-flat capability.

43. B — A rhythmic tapping localized to the rocker arm area with no misfires detected is a valve train mechanical noise — not a combustion-related event. The rocker arm's contact pad wears against the valve stem tip and camshaft lobe over hundreds of millions of cycles. A worn contact surface or a loose rocker arm pivot creates a gap that produces a tapping noise as the rocker follows the cam profile. At higher RPM, increased oil pressure helps cushion the contact and the faster cycling rate makes the individual taps less audibly distinct.

44. C — Transmission fluid begins to oxidize and break down rapidly above 200°F. At 270°F, the fluid is experiencing severe thermal degradation — its friction modifiers are depleted, its viscosity is dropping, and the clutch plates and seals are being damaged by the heat. The commonly cited rule is that

fluid life is halved for every 20°F increase above 200°F. At 270°F, the fluid's useful life is being consumed approximately 8× faster than normal. Continued driving risks permanent transmission damage. The cause of overheating (low fluid, cooler restriction, converter problem) must be diagnosed.

45. A — Unilateral inside-edge wear on one rear tire only — with the other rear showing even wear — indicates a camber problem specific to that one wheel. Excessive negative camber tilts the top of the tire inward, loading the inside edge. A single-side camber issue is typically caused by a bent control arm, a shifted subframe bolt, a worn control arm bushing allowing the knuckle to tilt, or collision damage to that corner's suspension components. A four-wheel alignment with individual camber measurements confirms the diagnosis.

46. D — Variable-assist power steering systems reduce assist at higher speeds to provide road feel and stability. The control mechanism — whether a hydraulic flow-control valve modulated by vehicle speed, or an electronic module controlling EPS motor output — varies the assist level based on speed. When this mechanism fails in the high-speed (low-assist) mode, parking-speed maneuvers feel excessively heavy because the system cannot increase assist when the speed signal indicates low speed. Highway driving feels normal because the reduced assist matches the intended high-speed calibration.

47. B — The aftermarket amplifier is wired directly to the battery with no remote turn-on wire — it stays powered at all times, including when the vehicle is off. Even at idle current draw (typically 0.5–2 amps for a standby amplifier), this continuous draw is far above the acceptable parasitic threshold and will drain the battery within hours or days. Connecting the amplifier's remote turn-on wire to a switched ignition source (a circuit that only has power when the key is in the RUN position) allows the amplifier to function during driving while drawing zero current when the vehicle is off.

48. C — Overnight, moisture from humidity condenses on the exposed brake rotor friction surfaces and forms a thin layer of surface rust — especially in humid climates or after rain. The first few brake applications scrape this rust off, producing a brief squealing or grinding sound as the rough oxidized surface contacts the pad. Once the rust is removed (typically within 2–5 brake applications), the clean metal-to-pad contact is restored and the noise disappears for the rest of the day. This is a normal, harmless condition that does not indicate any brake system fault.

49. B — Turbochargers spin at speeds up to 200,000+ RPM and rely on engine oil pressure to lubricate and cool the center bearing housing. Oil seals on both the compressor (intake) and turbine (exhaust) sides prevent this oil from entering the airstream. When these seals wear, oil seeps into the compressor housing (where it is drawn into the intake and burned during combustion) or into the turbine housing (where it enters the exhaust stream and is consumed by the catalytic converter). Both paths consume oil without producing visible tailpipe smoke.

50. A — The scan tool bidirectional injector shutoff test is a cylinder contribution test. By commanding a specific injector OFF, the technician removes that cylinder's contribution to engine output. If the cylinder was firing and contributing power, the engine will drop in RPM and run rougher when the injector is disabled. If RPM does NOT change, that cylinder was already not contributing — confirming the injector is not delivering fuel (stuck closed, no electrical signal, severely clogged). This test definitively identifies dead cylinders without physical disassembly.

51. B — A P0420 code means the OBD II catalyst monitor has detected that the Bank 1 catalytic converter's oxygen storage capacity has fallen below the system's efficiency threshold. This is an emissions compliance issue — the vehicle produces higher-than-allowed hydrocarbon and carbon monoxide emissions. However, a degraded converter does not affect braking, steering, suspension, or any safety system. The vehicle is safe to drive but will fail emissions testing in jurisdictions that require it, and the customer should plan for converter replacement.

52. C — The ring and pinion gears in a rear differential mesh under two distinct loading conditions: the drive side of the teeth carry the load during acceleration, and the coast side carries the load during deceleration. As the gear teeth wear or if the mesh pattern is incorrect, the transition between drive and coast loading produces a noticeable change in the noise's character — the pitch, volume, or tone shifts at exactly the moment the driver transitions from gas to coast. This drive-to-coast noise change is the single most diagnostic characteristic of differential gear problems.

53. D — Variable-assist power steering modulates assist force based on vehicle speed. At parking speeds, maximum assist is needed because the tires must be steered against the full friction of the pavement with no vehicle momentum to help. At highway speeds, assist is intentionally reduced to provide road feel and directional stability. When the variable-assist mechanism fails in the reduced-assist (highway) position, low-speed steering effort becomes excessive while highway steering feels normal. The control valve, speed-sensitive solenoid, or EPS module is stuck in its high-speed mode.

54. A — This is the most frequently tested brake service question across the entire 12-exam series because it represents the single most common brake comeback in real-world shops. Hub surface contamination — even a few thousandths of an inch of rust, corrosion, or debris between the rotor hat and the hub mounting face — induces lateral runout in the rotor that was not present before installation. The rotor is manufactured flat, but it BECOMES warped by the uneven surface it's mounted on. Cleaning the hub face to bare metal with a wire brush or abrasive pad before every rotor installation prevents this problem entirely.

55. B — Lane departure warning systems use a forward-facing camera (typically mounted near the rearview mirror) to detect painted lane markings on the road. The camera requires a clear, unobstructed

optical path through the windshield. Windshield haze, dirt film, interior dashboard reflections, aftermarket tint strips in the camera's field of view, a sun shade left partially deployed, or even a cracked windshield in the camera zone can prevent the camera from detecting lane markings. Cleaning or clearing the obstruction from the camera's viewing area restores system function.