PRACTICE EXAM 5: ASE G1 SIMULATION — 55 QUESTIONS

1. A technician is using an outside micrometer to measure brake rotor thickness. The thimble reads 0.600 inches and the vernier line indicates an additional 0.022 inches. What is the total reading?

A. 0.622 millimeters

B. 0.600 inches

C. 0.622 inches

D. 6.22 inches

2. A vehicle is towed in with a lockedup engine. The customer states the oil light had been flickering for several weeks before the failure. Which of the following BEST explains the progression of this failure?

A. The oil pressure sending unit was faulty and gave false warnings unrelated to the failure

B. The oil filter bypass valve was stuck open, sending unfiltered oil to the bearings

C. The oil pump pickup tube Oring was leaking air intermittently during cornering

D. Oil pressure was critically low due to wear or low oil level, and continued operation destroyed the bearing surfaces

3. Which of the following personal protective equipment (PPE) items is required when performing a battery service that involves charging, jumpstarting, or handling battery acid?

A. Safety glasses (or face shield) and acidresistant gloves

B. A fullface respirator rated for sulfuric acid fumes

C. Steeltoed boots and a leather apron

D. Hearing protection due to the risk of battery explosion

4. A technician is diagnosing a vehicle with a P0136 DTC (O2 Sensor Circuit — Bank 1, Sensor 2). Which sensor does this code refer to?

A. The upstream (precatalytic converter) oxygen sensor on Bank 1

B. The downstream (postcatalytic converter) oxygen sensor on Bank 1

C. The upstream oxygen sensor on Bank 2

D. The wideband airfuel ratio sensor on Bank 1

5. A customer's vehicle has uneven brake pad wear — the inner pad is worn significantly more than the outer pad on the same caliper. Which of the following is the MOST likely cause?

A. Brake pads installed in the wrong position (inner and outer swapped)

B. Excessive brake rotor lateral runout pushing the pads unevenly

C. A contaminated brake pad surface with embedded debris

D. A sticking or seized caliper slide pin preventing the caliper from floating properly

6. Technician A says that used engine coolant can be disposed of by pouring it into the shop floor drain. Technician B says that used coolant must be collected, stored, and disposed of or recycled in accordance with local environmental regulations. Who is correct?

A. Technician A only

B. Both Technician A and Technician B

C. Technician B only

D. Neither Technician A nor Technician B

7. A technician is testing a suspect ignition coil's primary winding resistance with a DMM. The specification is 0.4–0.8 ohms. The meter reads 14.2K ohms. What does this indicate?

A. The primary winding has an open circuit, and the coil must be replaced

B. The reading is within the acceptable range for a highenergy ignition coil

C. The technician is accidentally reading the secondary winding resistance

D. The DMM is malfunctioning and should be recalibrated

8. During a predelivery inspection on a new vehicle, a technician discovers that the driver's side airbag warning light stays on continuously. Which of the following is the correct action?

A. Deliver the vehicle and schedule a followup appointment for the airbag system

B. Do not release the vehicle until the airbag warning light issue is diagnosed and resolved

C. Reset the light by disconnecting the battery for 10 minutes and rescanning for codes

D. Inform the customer that the light is an indicator only and does not affect vehicle safety

9. A vehicle's manual transmission is difficult to shift into all gears and the clutch pedal feels normal. The clutch hydraulic system has been bled and inspected. Which of the following is the MOST likely cause?

A. A worn clutch pressure plate with weak diaphragm spring fingers

B. A contaminated clutch disc causing the disc to grab

C. An incorrect pilot bearing that is binding on the transmission input shaft

D. Low or incorrect lubricant in the transmission causing synchronizer difficulty

10. A technician connects a vacuum gauge to the intake manifold of an idling engine. The gauge reads a steady 17 inches of mercury (in. Hg). The specification for this engine at sea level is 17–21 in. Hg. Which of the following is correct?

A. The reading indicates a significant vacuum leak that must be found and repaired

B. The reading is at the low end of the acceptable range and could indicate early valve wear, late timing, or slight restriction but does not confirm a single fault without further testing

C. The engine has a blown head gasket causing vacuum loss

D. The reading is normal and indicates the engine is in excellent mechanical condition

11. A technician needs to measure the inside diameter of a brake drum to determine if it can be machined. Which of the following tools is MOST appropriate?

A. A brake drum micrometer (inside micrometer or drum gauge)

B. An outside micrometer with a ratchet stop

C. A steel ruler and a depth gauge

D. A dial indicator mounted on a magnetic base

12. A vehicle has been brought in for an oil change. The customer requests that the technician use 0W20 full synthetic oil. The vehicle's owner's manual specifies 5W30 conventional oil. Which of the following is the correct response?

A. Use the 0W20 as requested since it is a higherquality synthetic oil

B. Use 0W20 since it provides better fuel economy and coldstart protection in all engines

C. Use the manufacturerspecified 5W30 and explain to the customer why the correct viscosity grade matters for their engine

D. Blend the 0W20 and 5W30 together to create a compromise viscosity

13. A vehicle's rear brakes are drum type. During inspection, the technician notices that the brake drum friction surface is scored with deep grooves. The drum is currently at 0.030 inches below the maximum diameter specification. Which of the following is the correct action?

A. Machine the drum to remove the scoring since there is still material remaining below maximum

B. Replace the drum because machining the scores would likely exceed the maximum diameter specification

C. Install the drum asis and use oversized brake shoes to compensate for the enlarged diameter

D. Polish the scored surface with emery cloth and reuse the drum

14. Technician A says that an engine with a stuckclosed EGR valve will typically run normally with no drivability complaints. Technician B says that a stuckopen EGR valve will cause rough idle, hesitation, and possible stalling. Who is correct?

A. Technician A only

B. Technician B only

C. Neither Technician A nor Technician B

D. Both Technician A and Technician B

15. A vehicle has a frontend vibration that starts at 45 mph and gets progressively worse as speed increases. The vibration is constant and does not change during braking. Tire balance has been verified. Which of the following is the MOST likely cause?

A. A separated (shifted) belt inside a tire that cannot be corrected by balancing

B. Warped front brake rotors

C. A worn pitman arm in the steering linkage

D. A weak front strut that is not dampening road inputs

16. A customer's vehicle has a battery that is 5 years old. The battery passes a load test but the customer is concerned about reliability during the upcoming winter. What is the correct recommendation?

A. The battery is good and no action is needed for at least two more years

B. Add distilled water to the cells to increase the battery's capacity for cold weather

C. Recommend proactive replacement based on the battery's age, as most batteries have a typical service life of 3–5 years

D. Install a battery blanket heater as an alternative to replacement

17. A scan tool shows live data for a MAP (Manifold Absolute Pressure) sensor reading 101 kPa with the engine off and the key on. Which of the following is correct?

A. The MAP sensor has shorted and is reading maximum voltage

B. The reading is correct because 101 kPa is approximately atmospheric pressure, which is what the manifold sees with the engine not running

C. The MAP sensor should read close to zero with the engine off

D. The reading indicates a stuck MAP sensor that is not responding to pressure changes

18. Technician A says that the firing order of an engine is determined by the crankshaft design and camshaft lobe arrangement. Technician B says that changing the spark plug wire routing can change the engine's firing order. 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

19. A vehicle's power window on the driver's side moves up and down very slowly compared to all other windows. The window does eventually reach the full up and full down positions. Which of the following is the MOST likely cause?

A. A faulty power window master switch with corroded contacts

B. Low battery voltage that cannot supply adequate current to the window motor

C. A blown fuse for the driver's window circuit causing reduced current flow

D. A binding window regulator, dry window channel guides, or a worn window motor

20. A technician is performing a fuel system pressure test on a port fuelinjected engine. With the engine running at idle, the gauge reads 5 psi below the manufacturer specification. When the vacuum hose to the fuel pressure regulator is disconnected, the pressure rises to specification. What does this indicate?

A. The fuel pump is failing and cannot maintain adequate output pressure

B. The fuel pressure regulator diaphragm is ruptured and leaking

C. This is normal operation — fuel pressure is designed to be lower when manifold vacuum is present and rises when vacuum is removed

D. The fuel filter is partially restricted, causing a pressure drop under vacuum conditions

21. A technician discovers that the engine oil in a vehicle is significantly overfilled — approximately 2 quarts above the full mark. The customer had the oil changed at another shop. What is the potential consequence of this condition?

A. The crankshaft counterweights can contact the oil, causing aeration, foaming, and loss of oil pressure, as well as potential catalytic converter damage from oil being forced past seals

B. Overfilling engine oil has no mechanical consequences and the excess will be burned off naturally

C. The excess oil will be automatically drained through the PCV system within 500 miles

D. The oil pressure will increase proportionally, providing additional engine protection

22. A vehicle with fourwheel disc brakes has a groaning noise when the brakes are applied at low speed. The pads have adequate friction material remaining. Which of the following is the MOST likely cause?

A. Glazed brake rotors that need to be resurfaced

B. Brake pads that have developed a hardened or glazed friction surface and are not gripping the rotor effectively

C. A loose brake caliper bracket that shifts during brake application

D. Contaminated brake fluid that is boiling at low temperatures

23. A vehicle's shift interlock prevents the transmission from being shifted out of Park. The brake lights work normally when the pedal is pressed. Which of the following is the MOST likely cause?

A. A faulty brake light switch that is not sending a signal to the shift interlock solenoid

B. A disconnected battery ground that is affecting all electronic modules

C. A failed transmission range sensor that cannot detect the Park position

D. A faulty shift interlock solenoid or its control circuit

24. Technician A says that a loose gas cap is the only cause of DTC P0440 (EVAP System Malfunction). Technician B says that P0440 can be caused by any fault in the EVAP system, including a faulty purge solenoid, vent solenoid, or leaking hoses. Who is correct?

A. Technician B only

B. Technician A only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

25. A vehicle's steering feels loose and wanders at highway speed. The ball joints and tie rod ends have been inspected and are tight. The tires are in good condition and properly inflated. Which of the following should the technician check NEXT?

A. The wheel lug nut torque on all four wheels

B. The exhaust system hangers for excessive movement

C. The steering gear for excessive internal play or worn rack bushings

D. The engine mounts for collapsed rubber

26. A technician is inspecting a serpentine belt routing on a vehicle and notices the belt is riding on the edge of one pulley rather than centered in the grooves. What is the MOST likely cause?

A. The belt is stretched beyond its service limit and needs replacement

B. A misaligned pulley or a seized idler/tensioner bearing that is cocked at an angle

C. The belt tensioner spring is too tight, forcing the belt off center

D. The belt is the wrong length for the application

27. A customer brings in a vehicle with a complaint that the engine makes a loud ticking noise at idle that gets quieter as the engine warms up. Oil level is correct. Which of the following is the MOST likely cause?

A. A collapsed hydraulic valve lifter that pumps up with oil pressure as the engine warms and oil thins

B. A worn timing chain that tightens as the guides expand with heat

C. A cracked exhaust manifold that seals as it expands with heat

D. Piston slap from a worn cylinder wall that quiets as the piston expands

28. A vehicle's OBD II readiness monitors were all reset when the battery was disconnected for a repair. The customer needs to pass an emissions inspection. What must occur before the vehicle can be retested?

A. The vehicle must be driven for a minimum of 500 miles to ensure all monitors complete

B. The PCM must be reprogrammed at the dealer to restore monitor completion status

C. The technician must use a scan tool to manually set each monitor to "Ready" status

D. The vehicle must be driven through the manufacturer's specific drive cycle to allow the monitors to run and complete

29. A technician is testing a coolant temperature sensor with a DMM. As the engine warms from cold to operating temperature, the resistance reading should:

A. Increase steadily from a low value to a high value

B. Decrease steadily from a high value to a low value

C. Remain constant regardless of temperature

D. Oscillate between high and low values as the thermostat cycles

30. A vehicle's A/C system gauge readings show lowside pressure at 10 psi and highside pressure at 90 psi. Normal specification is 25–35 psi low and 150–250 psi high. Both pressures are below specification. Which of the following is the MOST likely cause?

A. A stuckopen expansion valve flooding the evaporator with refrigerant

B. A restricted condenser preventing adequate heat rejection

C. An undercharged system due to a refrigerant leak

D. A compressor operating at maximum capacity on a hot day

31. A technician retrieves DTC P0507 (Idle Air Control System — RPM Higher Than Expected). After clearing the code, the engine idles at 1,200 RPM. Which of the following is the MOST likely cause?

A. A clogged idle air control valve restricting air bypass flow

B. A weak ignition coil reducing combustion efficiency at idle

C. A leaking exhaust manifold gasket allowing air to enter the engine

D. A vacuum leak at the intake manifold, throttle body gasket, or a disconnected vacuum hose allowing unmetered air into the engine

32. A technician needs to safely remove a radiator pressure cap from a hot cooling system to check the coolant level. Which of the following is the correct procedure?

A. Wait until the engine has cooled and the upper radiator hose is no longer pressurized, then slowly turn the cap to the first stop to release residual pressure before fully removing it

B. Place a shop rag over the cap, turn it quickly to full open, and step back to avoid steam

C. Open the radiator petcock first to relieve pressure, then remove the cap

D. Run the engine at high idle for 5 minutes to circulate coolant before removing the cap while hot

33. A vehicle has a clunking noise from the front when turning left or right from a stop. The noise is a single clunk at the start of the turn, not a rhythmic clicking. CV axle boots are intact and the joints are tight. Which of the following is the MOST likely cause?

A. A worn front wheel bearing with excessive endplay

B. A worn front sway bar end link or sway bar bushing

C. A faulty front strut bearing plate making the clunk as the strut assembly rotates with steering input

D. A loose front brake caliper bracket bolt

34. A vehicle equipped with an automatic transmission has a shudder that occurs at 40–50 mph during light throttle. The shudder stops if the driver presses the accelerator harder or lifts off the throttle completely. Which of the following is the MOST likely cause?

A. An engine misfire under light load conditions

B. A worn driveshaft Ujoint that vibrates at specific speeds

C. A failing torque converter clutch (TCC) that is slipping during lockup engagement

D. An outofbalance tire and wheel assembly

35. A vehicle's cooling fan runs continuously from the moment the engine is started, even when the engine is cold. There are no DTCs. Which of the following is the MOST likely cause?

A. A stuckclosed thermostat preventing coolant from reaching the temperature sensor

B. A faulty alternator overcharging the system and powering the fan through voltage spill

C. The radiator cap is stuck open, allowing continuous coolant flow

D. A shorted cooling fan relay, a faulty engine coolant temperature sensor reading hot, or a disconnected sensor connector causing the PCM to command the fan on as a default

36. Technician A says that replacing a vehicle's cabin air filter is part of routine scheduled maintenance. Technician B says that the cabin air filter only needs replacement if the customer reports a musty odor from the vents. 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

37. A vehicle has a vibration felt in the seat and floorboard but NOT in the steering wheel at highway speed. Which of the following is the MOST likely source?

A. An outofbalance front tire and wheel assembly

B. A worn front tie rod end

C. A rear tire/wheel balance problem, rear driveshaft imbalance, or rear suspension component

D. A worn front upper strut mount

38. During a brake inspection, a technician notices that the brake fluid in the master cylinder reservoir appears dark and contaminated. A test strip indicates the fluid's copper content exceeds 200 ppm. What does this indicate?

A. The fluid is contaminated with power steering fluid and the entire system must be flushed and rebuilt

B. The copper content is within the normal range for brake fluid over 2 years old

C. The brake fluid has absorbed excessive air and the system must be vacuum bled

D. The brake fluid has absorbed moisture and the corrosion inhibitors are depleted, requiring a complete fluid flush

39. A technician is attempting to retrieve DTCs from a vehicle's PCM but the scan tool displays "No Communication." All other vehicle electronic systems appear to function normally. Which of the following should the technician check FIRST?

A. The PCM for a possible internal communication processor failure

B. The data link connector (DLC) for damaged pins, no power, or missing ground at the OBD II connector

C. The CAN bus termination resistors at the end of the communication network

D. The vehicle's ECU for a software version mismatch with the scan tool

40. A customer reports that the vehicle's electric cooling fans cycle on and off rapidly — turning on for a few seconds, off for a few seconds, and repeating. Coolant temperature is normal. Which of the following is the MOST likely cause?

A. A faulty engine coolant temperature sensor or A/C pressure sensor sending erratic signals to the fan control module

B. The cooling fans are oversized replacement units drawing excessive amperage

C. The thermostat is cycling open and closed rapidly, causing temperature swings

D. The fan blades are contacting the fan shroud intermittently during operation

41. A vehicle owner asks what the "maintenance required" indicator light means. The vehicle has 8,000 miles since its last oil change. Which of the following is the correct explanation?

A. The light is a reminder to check or reset the oil life monitor and does not indicate an active engine problem

B. The light indicates that the PCM has detected a pending emissionsrelated fault

C. The light comes on only when the oil pressure drops below safe operating limits

D. The light is a mileagebased or timebased reminder that scheduled maintenance is due and should not be confused with the check engine light

42. A technician is diagnosing a vehicle that starts and runs but has no charging system output. The battery voltage reads 12.4 volts with the engine running. A voltmeter on the alternator B+ terminal also reads 12.4 volts. Which of the following is the MOST likely cause?

A. Excessive resistance in the charging circuit wiring between the alternator and battery

B. A faulty voltage regulator commanding a higherthannormal set point

C. The alternator is not generating output due to a failed rotor, brushes, stator, or regulator

D. The battery has an internal open cell preventing it from accepting a charge

43. A technician is replacing a tire that has a nail puncture in the center of the tread. The tire has 6/32nds of tread depth remaining. The puncture is a clean hole with no sidewall damage. Which of the following is the correct repair?

A. A plugpatch (combination repair) applied from the inside of the tire after removing it from the rim

B. An external plug inserted from outside the tire without removing the tire from the rim

C. A patch applied to the inside of the tire without probing or sealing the puncture channel

D. Replacement of the tire since any puncture in a steelbelted radial tire compromises structural integrity

44. A vehicle's headlights dim noticeably when the power windows, blower motor, and heated seats are all operating simultaneously. The engine is idling. Which of the following is the MOST likely cause?

A. A faulty headlight relay that cannot handle the combined electrical load

B. An alternator that is being taxed beyond its output capacity at idle, causing system voltage to drop

C. A headlight wiring harness with excessive resistance that increases under high electrical demand

D. The battery management system is intentionally reducing headlight brightness to protect the charging system

45. A technician is performing a tire pressure check and finds one tire at 24 psi when the specification is 35 psi. The tire has no visible damage or embedded objects. After inflating to 35 psi, the tire is at 31 psi the next morning. Which of the following is the MOST appropriate next step?

A. Replace the tire since it cannot maintain pressure without a visible cause

B. Replace the valve core since it is the most common cause of invisible slow leaks

C. Submerge the tire and wheel assembly in water or apply a soapy water solution to locate the leak source at the bead, valve stem, or tread area

D. Install a can of tire sealant to plug any internal leak

46. A vehicle with a turbocharged engine has reduced power and a hissing noise under acceleration. There are no DTCs stored. Which of the following is the MOST likely cause?

A. A clogged engine air filter restricting airflow into the turbocharger

B. A faulty wastegate stuck in the closed position, overboosting the engine

C. A worn turbo bearing causing the compressor wheel to contact the housing

D. A boost leak from a loose or cracked intercooler hose or charge pipe allowing pressurized air to escape

47. A technician is replacing a wheel bearing assembly on a frontwheeldrive vehicle. After pressing the new bearing into the knuckle, which of the following is a critical final step?

A. Packing the new sealed bearing with additional hightemperature wheel bearing grease

B. Torquing the axle nut to the manufacturer's specification, as incorrect torque can cause premature bearing failure

C. Adjusting the bearing preload using a dial indicator and torque wrench

D. Installing a new cotter pin through the axle nut without torquing to allow the bearing to selfadjust

48. Technician A says that an engine's compression ratio is adjustable and can be changed by the technician during a tuneup. Technician B says that the compression ratio is a fixed design characteristic determined by the engine's bore, stroke, combustion chamber volume, and piston crown shape. Who is correct?

A. Technician B only

B. Technician A only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

49. A vehicle has a P0300 (Random/Multiple Cylinder Misfire Detected) code and the engine runs poorly under load. Individual cylinder misfire codes are not present. Which of the following is the MOST likely cause?

A. A single fouled spark plug on one cylinder

B. A faulty ignition coil on a single cylinder

C. A problem that affects all cylinders simultaneously, such as low fuel pressure, a major vacuum leak, or a restricted exhaust

D. A single burned exhaust valve on one cylinder

50. A vehicle's rear suspension sags on one side. The vehicle is not overloaded and there is no cargo in the trunk. Which of the following is the MOST likely cause?

A. A worn rear wheel bearing allowing the spindle to drop

B. A worn rear lateral link bushing causing axle misalignment

C. A leaking rear shock absorber on the sagging side

D. A broken or fatigued rear coil spring or leaf spring on the sagging side

51. A technician is using a DVOM to check for AC voltage ripple at the battery with the engine running. The meter reads 800 millivolts AC. The specification maximum is 500 millivolts AC. What does this indicate?

A. The battery's internal plates have sulfated and are reflecting voltage back to the alternator

B. One or more alternator diodes in the rectifier bridge have failed, allowing AC current to pass into the DC system

C. The voltage reading is within the acceptable range and does not indicate a fault

D. The battery cables are corroded and converting DC to AC through resistance

52. A customer asks whether it matters which terminal is disconnected first when removing a battery and which is reconnected first when reinstalling it. What is the correct answer?

A. Disconnect the negative terminal first and reconnect it last to prevent accidental short circuits through the vehicle's grounded chassis

B. Disconnect the positive terminal first and reconnect it last to prevent damage to the alternator diodes

C. The order does not matter on modern vehicles because the battery management system protects against short circuits

D. Both terminals should be disconnected simultaneously using two wrenches to equalize the voltage drop

53. A vehicle's exhaust smells strongly of raw gasoline. The engine runs rough and the check engine light is flashing. Which of the following does the flashing check engine light indicate?

A. A minor emissions fault that should be addressed at the next scheduled service

B. The vehicle's fuel cap is loose and requires tightening

C. An oxygen sensor heater circuit fault that is warming up

D. A severe misfire condition that is occurring and can damage the catalytic converter if driving continues

54. A technician is testing a MAF (Mass Airflow) sensor. At idle, the scan tool shows the MAF reading is 2.8 grams per second. The specification for this engine at idle is 3.5–5.0 g/s. Which of the following is the MOST likely cause of the low reading?

A. A vacuum leak downstream of the MAF sensor allowing unmetered air into the engine

B. An exhaust restriction reducing the engine's volumetric efficiency

C. A contaminated MAF sensor element that is underreporting the actual airflow

D. A restricted air filter before the MAF sensor that is reducing total airflow into the engine

55. A vehicle equipped with a conventional (nonlimitedslip) open differential experiences a condition where one drive wheel spins freely on ice while the other wheel remains stationary. Which of the following is correct?

A. The differential ring gear has cracked and is only driving one axle shaft

B. This is normal operation for an open differential — torque follows the path of least resistance to the wheel with the least traction

C. The axle shaft on the stationary wheel has sheared and is no longer connected to the differential

D. The differential spider gears have seized and must be replaced

Practice Exam 5: Answer Key and Full Explanations

1. C — An outside micrometer reading is determined by adding the thimble reading to the vernier (sleeve) reading. The thimble indicates 0.600 inches and the vernier adds 0.022 inches, totaling 0.622 inches. Understanding precision measuring instruments like micrometers is fundamental to brake service — rotor thickness determines whether a rotor can be machined or must be replaced, and misreading a micrometer by even a few thousandths can result in using an unsafe rotor.

2. D — A flickering oil light indicates that oil pressure is dropping intermittently to the minimum threshold of the sending unit — typically 5–10 psi. This is a warning that the lubrication system is failing to maintain adequate pressure, usually from bearing wear, low oil level, or a worn oil pump. Continued driving starves the crankshaft and camshaft bearings of their protective oil film, progressively destroying them until the engine seizes.

3. A — Battery acid (sulfuric acid) can cause severe chemical burns to skin and eyes, and batteries can produce hydrogen gas that is explosive. The minimum required PPE for battery service is safety glasses or a face shield to protect the eyes and acid-resistant gloves to protect the hands. OSHA and shop safety standards mandate eye and hand protection whenever there is a risk of exposure to corrosive chemicals.

4. B — In OBD II oxygen sensor naming convention, Bank 1 identifies the cylinder bank containing cylinder number 1, and Sensor 2 is always the downstream (post-catalytic converter) sensor. Sensor 1 is upstream (pre-converter). This naming convention is standardized across all manufacturers and is critical for correctly identifying which sensor a DTC refers to during diagnosis.

5. D — A floating caliper relies on slide pins to allow the caliper body to move laterally and apply equal clamping force to both the inner and outer brake pads. When a slide pin seizes or sticks, the caliper cannot float, and the hydraulic piston pushes only the inner pad against the rotor while the outer pad barely contacts the surface. This produces the classic pattern of an inner pad worn down to metal while the outer pad still has significant material.

6. C — Technician B is correct. Used engine coolant — particularly ethylene glycol-based coolant — is toxic to humans and animals and is classified as a regulated waste in most jurisdictions. It must be collected in approved containers and disposed of through a licensed recycler or waste handler. Pouring coolant into floor drains is an environmental violation that can result in significant fines and contamination of water supplies.

7. A — An ignition coil's primary winding specification of 0.4–0.8 ohms means the winding is a very low-resistance circuit. A reading of 14.2K ohms (14,200 ohms) is astronomically higher than specification, indicating the wire in the primary winding has broken — creating an open circuit. No current can flow through the primary winding, so the coil cannot generate a magnetic field and will not produce spark. The secondary winding typically reads 6,000–15,000 ohms, so 14.2K could represent a secondary reading, but the question specifies the technician is measuring the primary.

8. B — The airbag supplemental restraint system (SRS) is a critical safety system. A continuously illuminated airbag warning light means the system has detected a fault and the airbags may not deploy in a collision. No vehicle should be delivered to a customer with a known SRS fault — the issue must be diagnosed and repaired before release. Liability and safety standards make this non-negotiable.

9. D — If the clutch pedal feels normal and the hydraulic system is confirmed functional, the clutch is disengaging properly — the issue is inside the transmission. Difficult shifting into all gears with a properly disengaging clutch points to a synchronizer lubrication problem. Low fluid level, incorrect fluid type, or degraded fluid prevents the synchronizer rings from creating the friction film needed to match shaft speeds during shifts, making every gear change feel notchy or resistant.

10. B — A vacuum reading of 17 in. Hg falls at the low end of the 17–21 in. Hg specification, meaning it is technically within range but not strong. Low-normal vacuum can have several causes — minor valve seating issues, slightly retarded ignition timing, a mild exhaust restriction, or altitude effects. No single diagnosis can be made from this reading alone; further testing such as a cylinder leak-down test, timing check, or exhaust backpressure test is needed to isolate the cause.

11. A — A brake drum micrometer (also called an inside micrometer or drum gauge) is specifically designed to measure the internal diameter of a brake drum at multiple points to determine both the drum's current size and whether it is out-of-round. An outside micrometer measures external dimensions like rotor thickness, not internal bores. Using the correct tool ensures accurate measurement against the maximum drum diameter specification.

12. C — Engine oil viscosity is engineered by the manufacturer to match the bearing clearances, oil passage sizes, and operating temperature range of the specific engine. Using a thinner oil than specified (0W-20 instead of 5W-30) can result in inadequate oil film thickness at operating temperature, increased oil consumption, and accelerated engine wear. The technician should always use the manufacturer-specified viscosity and explain the reason to the customer.

13. B — The drum is already 0.030 inches below the maximum diameter specification, meaning it is 0.030 inches larger than its original size. Deep scoring requires removing additional material during machining — typically at least 0.015–0.020 inches per side. This additional material removal would push the drum past its maximum diameter limit, making it unsafe for use. The drum must be replaced.

14. D — Both technicians are correct. A stuck-closed EGR valve prevents exhaust gas recirculation, which raises combustion temperatures and increases NOx emissions but does not typically cause noticeable drivability symptoms because the engine runs on a normal air-fuel mixture. A stuck-open EGR valve introduces exhaust gas into the intake at all times — including idle — which dilutes the combustible mixture with inert gas, causing rough idle, hesitation, and possible stalling because the engine cannot burn the diluted mixture efficiently.

15. A — A vibration that starts at a specific speed and gets progressively worse as speed increases — unaffected by braking and not correctable by tire balancing — is the classic symptom of a separated (shifted) internal belt in a tire. The shifted belt creates an egg-shaped or lopsided rolling surface that produces a vibration proportional to wheel speed. This is a tire defect that no amount of weight can compensate for; the tire must be replaced.

16. C — A battery that passes a load test today may still fail when cold temperatures demand higher cranking current and cold reduces the battery's chemical capacity. Most automotive batteries have a reliable service life of 3–5 years, and a 5-year-old battery is statistically at the end of its lifespan. Proactive replacement before winter prevents the customer from being stranded in cold weather, which is both good practice and good customer service.

17. B — A MAP sensor measures absolute pressure in the intake manifold. With the engine off and the key on, the intake manifold is open to atmospheric pressure through the throttle body. Standard atmospheric pressure at sea level is approximately 101 kPa (14.7 psi / 29.92 in. Hg). A reading of 101 kPa with the engine off confirms the sensor is accurately reporting atmospheric pressure — this is actually a quick functional check of the MAP sensor.

18. A — Technician A is correct. The firing order is a fixed design characteristic determined by the physical arrangement of the crankshaft journals (which cylinder is at TDC when) and the camshaft lobe positions (which valves open when). Technician B is incorrect: changing spark plug wire routing does not change the firing order — it simply sends spark to the wrong cylinder at the wrong time, causing a severe misfire or no-start condition. The engine's mechanical firing order is unchangeable without redesigning the crankshaft and camshaft.

19. D — Since the window eventually reaches both full-up and full-down positions, the motor is receiving power and the switch is functional — the problem is mechanical resistance or a weakening motor. A binding regulator mechanism (worn cables, bent tracks, or dry guide channels) forces the motor to work harder against friction, slowing the window movement. Alternatively, the motor itself may have worn brushes or a developing commutator fault that reduces its torque output.

20. C — On a vacuum-referenced fuel pressure regulator, manifold vacuum acting on the regulator diaphragm reduces fuel pressure by an amount equal to the vacuum present. When the vacuum hose is disconnected, the regulator sees atmospheric pressure instead of vacuum, and fuel pressure rises to its base (non-vacuum-adjusted) specification. This vacuum-compensated design maintains a constant pressure differential across the injectors regardless of manifold vacuum changes during driving. This is completely normal operation, not a fault.

21. A — Significantly overfilled engine oil raises the oil level into the path of the spinning crankshaft counterweights. The counterweights whip through the excess oil at high speed, aerating it into a frothy mixture that the oil pump cannot effectively pressurize. The resulting loss of oil pressure starves the bearings, and the aerated oil can also be forced past valve seals and piston rings into the combustion chambers, fouling spark plugs and damaging the catalytic converter with oil contamination.

22. B — A groaning or moaning noise during low-speed braking with adequate pad material points to a glazed pad friction surface. Glazing occurs when brake pads are overheated or when the vehicle sits for extended periods, hardening the surface layer of the friction material. The hardened surface cannot grip the rotor efficiently and produces a low-frequency vibration heard as a groan. Scuffing the pad surface with sandpaper or replacing the pads resolves the condition.

23. D — Since the brake lights work normally, the brake light switch is sending a signal when the pedal is pressed — this eliminates the switch as the cause. The shift interlock solenoid is the electromechanical device that physically locks the shift lever in Park until it receives a signal (from the brake switch circuit, through a relay or BCM) to release. If the solenoid itself has failed or its specific control circuit is open, the solenoid cannot retract the locking pin even though the brake switch is functioning.

24. A — Technician B is correct. DTC P0440 is a general EVAP system malfunction code that can be triggered by any component failure in the evaporative emission control system — including a faulty purge solenoid, vent solenoid, leaking hoses, a cracked charcoal canister, or a leak in the fuel tank itself. Technician A is incorrect in stating that a loose gas cap is the ONLY cause; while it is a common cause, P0440 covers the entire EVAP system.

25. C — With ball joints and tie rod ends confirmed tight and tires in good condition, the steering gear itself becomes the next suspect. A rack-and-pinion gear with worn internal components — such as an excessively loose rack bearing preload, worn pinion teeth, or deteriorated rack bushings — allows the steering to have excessive dead zone (play) at center, producing the vague, wandering feeling at highway speed. Adjusting the rack bearing preload or replacing the gear resolves the looseness.

26. B — A belt that tracks off-center on one pulley while running true on all others indicates that the offending pulley is misaligned relative to the rest of the belt path. The most common cause is a seized or cocked idler pulley or tensioner bearing that has worn its bearing and tilted the pulley face at an angle. A misaligned accessory bracket or an improperly installed replacement component can also shift a pulley out of plane. A straight edge across the pulleys confirms misalignment.

27. A — A ticking noise at idle that diminishes as the engine warms is the signature of a collapsed hydraulic valve lifter (lash adjuster). When the engine is cold and oil is thick, the lifter cannot fill quickly enough with pressurized oil to take up the valve lash, creating a ticking noise as the rocker arm strikes the valve stem across the gap. As the engine warms and oil thins, the lifter fills and extends, eliminating the clearance and silencing the tick.

28. D — OBD II readiness monitors are self-tests that the PCM runs under specific driving conditions to verify that emissions systems are functioning correctly. When battery power is lost, all monitor completion flags are reset to "Not Ready." The only way to restore them is to drive the vehicle through the manufacturer-prescribed drive cycle — a specific sequence of operating conditions (cold start, highway cruise, deceleration, idle) — that enables each monitor to run and complete its test. There is no shortcut or manual override.

29. B — The engine coolant temperature sensor is a negative temperature coefficient (NTC) thermistor, meaning its resistance DECREASES as temperature INCREASES. When cold, the sensor has high resistance (typically 10,000+ ohms); at operating temperature, resistance drops to approximately 200–1,000 ohms. The PCM interprets this resistance change as a voltage signal to determine engine temperature. This inverse relationship between temperature and resistance is one of the most frequently tested concepts on the ASE exam.

30. C — Both low-side and high-side pressures being significantly below normal specifications is the textbook gauge reading for a system that has lost a substantial portion of its refrigerant charge. With less refrigerant mass circulating, there is less gas to compress on the high side and less liquid to evaporate on the low side, pulling both readings down proportionally. The technician must locate and repair the leak before recharging the system.

31. D — DTC P0507 indicates the idle speed is higher than the PCM's target. An unmetered vacuum leak downstream of the throttle plate allows air to bypass the throttle and enter the intake manifold, raising the idle speed above the PCM's commanded value. Common sources include a cracked intake manifold, a torn throttle body gasket, a disconnected PCV hose, or a broken vacuum line to a brake booster or EVAP purge valve. Identifying and sealing the leak restores normal idle speed.

32. A — A hot cooling system is pressurized, and removing the cap while pressurized releases superheated coolant as scalding steam that can cause severe burns. The safe procedure is to wait until the engine has cooled and the upper radiator hose can be squeezed (indicating pressure has dropped), then slowly turn the cap to the first safety stop, which vents any residual pressure before the cap is fully removed. Never remove a radiator cap from a hot, pressurized system.

33. B — A single clunk at the initiation of a turn — not a rhythmic clicking — from the front end with intact CV boots and tight joints points to a worn sway bar end link or deteriorated sway bar bushing. As the vehicle enters a turn, body roll loads the sway bar, and any play in the end links or bushings produces a single clunk as the slack is taken up. This is one of the most common and least expensive front-end noise sources, and it is easily confirmed by grasping the sway bar link by hand and checking for play.

34. C — A shudder at light throttle in the 40–50 mph range that disappears with more throttle or when coasting is the classic symptom of a failing torque converter clutch (TCC) during its lockup engagement. At light throttle cruise speed, the PCM commands TCC lockup to improve fuel economy. If the TCC friction material is worn, contaminated, or the apply pressure is insufficient, the clutch slips during engagement, producing a shudder. Increased throttle pressure locks the clutch fully, and lifting off disengages it — both eliminating the shudder.

35. D — A cooling fan that runs continuously from cold startup — with no DTCs — indicates the PCM is receiving a signal that tells it to run the fan at all times. A shorted fan relay that is stuck closed bypasses the PCM command entirely. A faulty ECT sensor sending a false "hot" signal, or a disconnected ECT sensor connector (which many PCMs interpret as maximum temperature as a failsafe), also commands the fan on continuously. The fan runs as a protective measure because the PCM believes the engine is overheating.

36. A — Technician A is correct. The cabin air filter is a scheduled maintenance item with manufacturer-specified replacement intervals (typically every 15,000–30,000 miles or annually). Its purpose is to filter dust, pollen, and contaminants from incoming air before it enters the passenger compartment. Technician B is incorrect: waiting until a musty odor appears means the filter has been clogged long enough for mold to grow on the evaporator — the filter should be replaced preventively, not reactively.

37. C — Vibrations felt in the seat and floorboard but NOT in the steering wheel originate from the rear of the vehicle, not the front. Front-end sources (out-of-balance front tires, worn tie rods, strut mounts) transmit vibrations primarily through the steering column to the steering wheel. Rear tire imbalance, driveshaft imbalance, or worn rear suspension components transmit vibration through the vehicle structure to the seat and floor, bypassing the steering system entirely.

38. D — Brake fluid test strips that measure copper content are an industry-standard method for assessing brake fluid condition. Copper enters the fluid as the corrosion inhibitors deplete and the fluid begins to attack the copper-lined internal passages of the ABS modulator and brake lines. A reading above 200 ppm indicates the fluid's protective additives are exhausted and the fluid is actively corroding system components. A complete brake fluid flush is required to restore corrosion protection.

39. B — When the scan tool displays "No Communication" but all other vehicle systems operate normally, the problem is almost always at the DLC itself — not the PCM. The OBD II connector requires power (pin 16), ground (pins 4 and 5), and communication bus connections (pins 6/14 for CAN, pin 7 for K-line) to establish communication. A damaged pin, a blown DLC fuse, a missing ground, or a corroded terminal prevents the scan tool from linking to the network. Always check the simple, accessible connection point before suspecting expensive module failure.

40. A — Rapid on-off cycling of the cooling fans with normal coolant temperature indicates the fan control module or PCM is receiving an erratic input signal that fluctuates above and below the fan activation threshold. A faulty ECT sensor with a failing element, a loose connector with an intermittent contact, or an erratic A/C high-pressure switch can produce a rapidly oscillating signal that commands the fan on, then off, then on again in quick succession. Monitoring sensor PIDs on a scan tool while the cycling occurs identifies which input is unstable.

41. D — The "maintenance required" or "maint reqd" indicator is a mileage-based or time-based reminder programmed by the manufacturer to alert the driver that scheduled maintenance (typically an oil change) is due. It is NOT connected to the OBD II diagnostic system and does NOT indicate an engine or emissions fault. Many customers confuse this light with the check engine light (MIL), and the technician should clearly explain the difference: maintenance required = service reminder; check engine = diagnostic fault.

42. C — If the alternator B+ terminal reads the same voltage as the battery (12.4V) with the engine running, the alternator is producing zero additional charging voltage. A functioning alternator should produce 13.5–14.8 volts at its B+ terminal. The 12.4V reading is simply the battery's resting voltage passing through the alternator without any generation occurring. The most common internal alternator failures that cause zero output are worn brushes that cannot contact the rotor slip rings, an open rotor winding, failed stator windings, or a completely failed internal voltage regulator.

43. A — The industry-standard tire repair method endorsed by the Rubber Manufacturers Association (now USTMA) is the combination plug-patch, also called a mushroom patch or integrated repair unit. The tire must be removed from the rim so the interior can be inspected for hidden damage, the puncture channel is cleaned and filled with the plug portion, and the patch portion seals the inner liner. External-only plugs do not seal the inner liner, and patches alone do not fill the puncture channel — neither is a complete permanent repair.

44. B — At idle, the alternator spins at a fraction of its maximum RPM and produces correspondingly less current. When multiple high-draw accessories are activated simultaneously, the combined electrical load exceeds what the alternator can produce at idle speed, causing system voltage to drop. The headlights dim because they receive reduced voltage. As engine RPM increases (driving), alternator output rises and the dimming disappears. This is a normal characteristic of a system that is at its design limit at idle, though an alternator with higher idle output may resolve the complaint.

45. C — A tire that loses 4 psi overnight with no visible damage or embedded objects has a slow leak that requires locating before any repair can be made. Submerging the mounted tire and wheel assembly in a water tank or spraying soapy water solution around the bead area, valve stem, and tread surface reveals the exact leak location as a stream of bubbles. Replacing the valve core without confirming it is the source wastes time if the leak is at the bead or a tread micro-puncture.

46. D — A hissing noise under acceleration on a turbocharged engine combined with reduced power and no DTCs is the classic presentation of a boost leak. Pressurized air from the turbocharger compressor is escaping through a loose clamp, cracked intercooler hose, or split charge pipe before it reaches the engine. The engine receives less air than the turbo is producing, resulting in lower-than-expected power. The hiss is audible because compressed air is escaping at high velocity through the leak point.

47. B — On modern front-wheel-drive vehicles with pressed-in or bolt-on sealed bearing assemblies, the axle nut torque is critical to bearing longevity and proper function. Under-torquing allows the bearing to have endplay, which accelerates wear and creates noise; over-torquing preloads the bearing excessively, generating heat and premature failure. The manufacturer's specification — often 150–200+ ft-lbs and sometimes requiring a new nut — must be followed precisely, and many specifications also require a specific tightening procedure (e.g., final torque with the vehicle on the ground).

48. A — Technician B is correct. The compression ratio is a fixed mathematical relationship between the total cylinder volume (when the piston is at BDC) and the clearance volume (when the piston is at TDC). It is determined at the factory by the engine's bore diameter, stroke length, piston crown shape,

head gasket thickness, and combustion chamber volume. It is not a serviceable or adjustable parameter during routine maintenance or tune-up work. Modifying compression ratio requires physical engine component changes.

49. C — A P0300 code without individual cylinder misfire codes (P0301, P0302, etc.) indicates that the misfires are not isolated to any single cylinder — they are occurring randomly across multiple or all cylinders. This pattern points to a systemic cause that affects the entire engine simultaneously: low fuel pressure starves all injectors, a major vacuum leak leans out the entire intake, or a restricted exhaust chokes all cylinders. Single-cylinder faults like one bad plug, one bad coil, or one burned valve would set a cylinder-specific code.

50. D — A vehicle that sags on one side of the rear suspension — with no overloading — has a spring that can no longer support its designed load. Coil springs fatigue and lose their free height over time, and leaf springs can crack or lose their arch. A broken or fatigued spring on one side allows that corner of the vehicle to sit lower than the other, creating a visible lean. Shock absorbers control the rate of spring movement but do not support vehicle weight, so a leaking shock would not cause sag.

51. B — An alternator converts AC to DC through a rectifier bridge (diode assembly). When one or more diodes fail in the open or shorted condition, they allow AC current to pass through into the vehicle's DC electrical system. The specification maximum of 500 millivolts AC recognizes that a small amount of AC ripple is normal, but 800 millivolts exceeds this threshold and confirms rectifier failure. Excessive AC ripple causes premature battery failure, erratic electronic module operation, and can damage sensitive components.

52. A — Disconnecting the negative terminal first eliminates the risk of accidental short circuits. If a wrench contacts any metal surface while removing the positive cable on a battery that still has its ground connected, the wrench completes a circuit through the vehicle's chassis and creates a direct short — producing sparks, arc burns, and potential battery explosion. With the negative (ground) disconnected first, touching metal with the wrench while removing the positive cannot create a circuit. Reconnection is the reverse: positive first, negative last.

53. D — A flashing check engine light (MIL) is the OBD II system's most urgent alert, indicating a severe catalyst-damaging misfire is actively occurring. Unlike a steady MIL, which indicates a fault that should be serviced soon, a flashing MIL means raw fuel is passing through the combustion chamber unburned and entering the catalytic converter, where it ignites and can overheat the substrate to destruction. The driver should reduce speed and load immediately and have the vehicle serviced as soon as possible.

54. C — A contaminated MAF sensor element — typically from oil mist from an over-oiled aftermarket air filter or PCV system blowby — accumulates a film on the hot wire or hot film element that insulates it from the actual airflow. The contaminated element cools more slowly, causing the sensor to underreport the true air mass entering the engine. This lower-than-actual reading makes the PCM deliver less fuel than needed, creating a lean condition. Cleaning the element with MAF-specific cleaner often restores accuracy.

55. B — Open (conventional) differential splits torque equally between both axle shafts, but it always sends torque to the wheel with the LEAST resistance to rotation. When one wheel is on ice (near-zero traction), essentially all the torque flows to that wheel because it takes almost no force to spin it — the wheel on dry pavement remains stationary because the differential does not force it to turn. This is normal open differential behavior and is the fundamental reason limited-slip and locking differentials were developed.