

PRACTICE EXAM 9: POSTAL AUTOMOTIVE TECHNICIAN EXAM (944) SIMULATION (100 QUESTIONS)

This 100-question practice exam is an expanded study simulation for USPS Automotive Technician Exam 944. USPS currently groups Exams 943/944/945 as Automotive Knowledge assessments and current Automotive Technician recruiting notices require Tests 943 and 944. The publicly linked automotive assessment package includes an Automotive Technician section, but USPS does not publish a separate current weighted blueprint or official 100-question format for Exam 944. This simulation therefore uses broad diagnostic coverage across engine performance, electrical systems, brakes, steering and suspension, drivetrain, cooling/fuel/emissions/HVAC, and maintenance diagnostics. Choose the single best answer for each question.

1. During a leak-down test, a cylinder sends a strong rush of air from the oil-filler opening. Which internal fault is most likely?

- A. Worn piston rings or cylinder-wall sealing
- B. A leaking exhaust valve
- C. A weak ignition coil
- D. A restricted catalytic converter

2. A vacuum gauge needle moves rapidly back and forth at idle, and one cylinder has low compression. Which condition best fits these findings?

- A. A thermostat stuck open
- B. A loose wheel bearing
- C. A burned or sticking valve
- D. An overcharged battery

3. All cylinders show uniformly low compression after an engine has had recent timing-belt service. What should be checked first?

- A. Brake-shoe adjustment
- B. Camshaft-to-crankshaft timing alignment
- C. Fuel-pump current draw
- D. Alternator ripple voltage

4. An engine has normal oil pressure when cold but drops below specification only after reaching full operating temperature. Which mechanical condition is a likely cause?

- A. A clogged cabin filter
- B. A shorted horn relay
- C. A seized parking-brake cable
- D. Excessive bearing clearance in the lubricated engine parts

5. A hydraulic lifter taps for several seconds after every cold start even though the oil level is correct. What should be investigated?

- A. Battery reserve capacity
- B. A/C refrigerant charge
- C. Front-wheel toe adjustment
- D. Lifter bleed-down or delayed lubrication

6. A timing belt breaks on an interference engine while the engine is running. What additional damage is especially possible?

- A. Warped brake rotors
- B. Bent valves from piston-to-valve contact
- C. A loose steering rack
- D. A discharged battery

7. A gasoline engine emits blue smoke mainly after idling for several minutes and then accelerating. Which fault is most likely?

- A. Worn valve-stem seals or guides
- B. An open brake-light switch
- C. A restricted fuel filter
- D. Excessive positive caster

8. Dense white exhaust vapor has a sweet odor and the coolant level falls with no external leak. What should be suspected?

- A. Excessive engine-oil viscosity
- B. Low alternator output
- C. Coolant entering a combustion chamber
- D. A dragging rear brake

9. A gasoline engine produces black exhaust smoke, poor fuel economy, and fuel-fouled spark plugs. Which general condition is present?

- A. An excessively rich air-fuel mixture
- B. A lean mixture from low fuel pressure
- C. A low power-steering level
- D. A weak shock absorber

10. A mechanic disables each injector one at a time while watching the rpm drop. What is the purpose of this test?

- A. Determine wheel offset
- B. Measure radiator pressure
- C. Compare the power contribution of individual cylinders
- D. Check refrigerant purity

11. A spark plug has a chalky white insulator with blistering and electrode erosion. Which operating condition can produce this appearance?

- A. A weak wiper motor
- B. A lean or overheated combustion condition
- C. Normal rich operation
- D. Low tire pressure

12. Which statement best distinguishes preignition from normal spark ignition?

- A. The starter motor continues running after release
- B. The mixture burns only after the exhaust valve opens
- C. The fuel pump stops whenever manifold vacuum rises
- D. The mixture begins burning before the commanded spark because of a hot spot

13. A positive crankcase ventilation valve is stuck closed. Which symptom can result as blow-by accumulates?

- A. Reduced tire rolling resistance
- B. Lower brake pedal effort
- C. Higher alternator frequency
- D. Increased crankcase pressure and oil leakage

14. A thermostat is stuck open. Which operating complaint is most likely during cold weather?

- A. Immediate overheating after a cold start
- B. Slow engine warm-up and weak heater output
- C. A high-pitched differential whine
- D. A hard brake pedal from air in the lines

15. A diesel engine cranks normally on a cold morning but starts poorly and produces white smoke for several seconds. Which system should be checked?

- A. Brake-boosters vacuum reserve

- B. Front toe setting
- C. Glow-plug operation and cold-start heating
- D. Alternator belt alignment only

16. A relative-compression test uses starter current or battery-voltage waveform while cranking. What can the technician identify?

- A. A cylinder with relatively low compression
- B. The refrigerant oil type
- C. Wheel bearing preload
- D. The exact coolant freeze point

17. An engine has adequate compression but low power, and one camshaft lobe is visibly worn. What effect can the worn lobe cause?

- A. Increased battery capacity
- B. More positive wheel camber
- C. Reduced valve lift and poor cylinder breathing
- D. Higher fuel-pump pressure

18. Valve lash on a mechanical valvetrain is adjusted too tight. What problem can appear as the engine heats up?

- A. The steering wheel may pull from tire conicity
- B. A valve may fail to seat fully and lose compression
- C. The alternator may overcharge
- D. The brake pedal may become spongy

19. A vehicle has a strong vibration at idle in Drive, but engine rpm is steady and misfire counters remain at zero. Which component should be inspected?

- A. Brake proportioning valve
- B. Rear axle gear ratio
- C. Oxygen-sensor heater circuits only
- D. Engine and transmission mounts

20. An engine cranks faster than normal after suddenly losing power, and compression is very low on every cylinder. Which failure is most likely?

- A. Loss of the camshaft timing drive
- B. A worn outer CV joint
- C. A weak battery cell
- D. A partially restricted fuel filter

21. Two 12-volt batteries are connected in series for a 24-volt vehicle system. What nominal voltage should be measured across the pair?

- A. 24 volts
- B. 48 volts
- C. 12 volts
- D. 6 volts

22. Two identical 12-volt batteries are connected in parallel. Which statement is correct?

- A. System voltage falls to 6 volts
- B. The batteries produce alternating current
- C. System voltage remains about 12 volts while available capacity increases
- D. System voltage becomes 24 volts

23. A charging system maintains 14.3 volts at the battery with the engine running and electrical loads applied. What does this generally indicate?

- A. The battery is completely open internally
- B. The starter solenoid is welded closed
- C. The ABS module is commanding brake release
- D. The alternator and regulator are maintaining normal charging voltage

24. A parked vehicle has a 0.25-amp parasitic draw for 8 hours. Approximately how many amp-hours are removed from the battery?

- A. 32 amp-hours
- B. 2 amp-hours
- C. 0.03 amp-hour
- D. 8 amp-hours

25. During cranking, the positive battery cable shows a 0.9-volt drop from battery post to starter terminal. What does this suggest?

- A. An overfilled cooling system
- B. A correctly operating cable with negligible loss
- C. A seized brake caliper
- D. Excessive resistance in the positive cable or its connections

26. A replacement fuse blows immediately each time the circuit is switched on. What fault should be suspected first?

- A. An open circuit with no current flow
- B. A short to ground or severe overload
- C. A fully charged battery
- D. A thermostat stuck open

27. A relay clicks when commanded, but the high-current load remains off. Power and ground at the load are otherwise intact. What should be checked?

- A. Relay contact resistance or burned load contacts
- B. Engine compression
- C. Tire tread depth
- D. Brake-fluid moisture

28. When checked with a digital meter in diode-test mode, a good rectifier diode should normally conduct how?

- A. Equally in both directions
- B. Only when the battery is disconnected for an hour
- C. Primarily in one direction and block in the opposite direction
- D. In neither direction under any test

29. An alternator has correct average charging voltage but excessive AC ripple at the battery. Which internal fault is likely?

- A. A failed rectifier diode or stator-related charging fault
- B. A worn tie-rod end
- C. A clogged heater core
- D. A loose parking-brake cable

30. Battery load testing passes and both starter-cable voltage drops are low. Cranking speed remains slow while starter amperage is above specification. Which diagnosis best fits?

- A. Low windshield-washer fluid
- B. A weak oxygen sensor
- C. An open starter circuit
- D. Mechanical drag or an internally shorted starter motor

31. A starter draws very little current and does not crank, even though battery voltage reaches the starter terminal. What fault is likely?

- A. Excessive engine mechanical drag
- B. An open or poor internal starter-motor connection
- C. An overfilled differential
- D. A shorted starter armature

32. A hydrometer shows one battery cell has much lower specific gravity than the other cells after charging. What does the imbalance suggest?

- A. A perfectly balanced fully charged battery
- B. A clogged fuel injector
- C. A weak or defective cell in the battery
- D. Excessive wheel camber

33. A simple series circuit opens at one connection. What happens to current through the loads in that series path?

- A. Only the first load receives extra current
- B. Voltage becomes alternating current
- C. Current doubles through every load
- D. Current stops through the entire series path

34. Two parallel branches draw 2 amperes and 3 amperes from the same source. What total current leaves the source?

- A. 5 amperes
- B. 6 amperes
- C. 1 ampere
- D. 2.5 amperes

35. A Hall-effect crankshaft sensor is operating normally. What type of output is commonly expected?

- A. A mechanical cable movement
- B. A constant zero-ohm resistance
- C. A digital switching signal that changes between voltage levels
- D. A steady hydraulic pressure

36. A negative-temperature-coefficient coolant sensor becomes hotter. What normally happens to its resistance?

- A. Resistance becomes negative in polarity
- B. Resistance decreases as temperature rises
- C. Resistance always becomes infinite
- D. Resistance doubles exactly every ten degrees

37. A 5-volt sensor-reference wire is accidentally shorted to battery positive. What is the primary concern?

- A. Brake pressure will immediately increase
- B. Damaging overvoltage on the reference circuit
- C. Wheel toe will automatically change
- D. The circuit will become a perfect ground

38. With a headlamp on, a technician measures 1.5 volts between the bulb ground terminal and battery negative. What does this reading indicate?

- A. High resistance in the lamp ground
- B. Low transmission line pressure
- C. A shorted thermostat
- D. Normal zero-loss grounding

39. One headlamp becomes dim only when another load sharing the same ground is switched on. What should be inspected first?

- A. Brake rotor thickness
- B. Fuel-pump pressure regulator
- C. Engine valve lash
- D. The shared ground connection for high resistance

40. A 12-volt motor draws 5 amperes while operating. Approximately how much electrical power is it using?

- A. 2.4 watts
- B. 120 watts
- C. 60 watts
- D. 17 watts

41. A brake pedal slowly sinks toward the floor while steady pressure is held, and no external fluid leak is visible. Which fault is most likely?

- A. Internal bypass leakage in the master cylinder
- B. An open fuel injector
- C. A seized wheel bearing
- D. A loose alternator belt

42. One front brake remains applied after the pedal is released. Opening that caliper bleeder immediately frees the wheel. What should be suspected?

- A. Low engine compression
- B. An open oxygen sensor heater
- C. A restricted flexible brake hose trapping hydraulic pressure
- D. A bent tie rod

43. A driver feels a repeating brake-pedal pulsation during moderate stops, and ABS is not active. What is a common cause?

- A. A weak battery cell
- B. Low power-steering fluid
- C. A clogged cabin air filter
- D. Brake rotor thickness variation or lateral runout

44. ABS activates briefly at very low speed on a dry road just before the vehicle stops. Which fault is likely?

- A. A rich fuel mixture
- B. Low-speed wheel-speed sensor dropout
- C. An overfilled radiator
- D. A worn engine mount

45. A hydro-boost vehicle suddenly has both very hard brake-pedal effort and very heavy power steering. Which common source should be checked?

- A. The cabin temperature sensor
- B. The oxygen sensor
- C. The hydraulic power-steering pump and its drive
- D. The brake-light bulb

46. Petroleum-based fluid is accidentally added to a conventional brake-fluid reservoir. What is the main concern?

- A. Rubber hydraulic seals can swell and deteriorate
- B. Wheel alignment will change immediately
- C. Brake fluid will become electrically conductive only
- D. Rotor diameter will increase

47. A parking-brake lever travels unusually far before holding the vehicle, but the service brakes operate normally. What should be inspected?

- A. Engine ignition timing
- B. Fuel pressure at the rail
- C. Alternator output voltage
- D. Parking-brake cable adjustment and rear mechanism clearance

48. In a drum brake, what is the purpose of the shoe return springs?

- A. Hold the wheel bearing preload
- B. Retract the shoes after brake release
- C. Raise engine manifold vacuum
- D. Increase master-cylinder bore size

49. A vehicle locks the rear wheels too easily during hard braking while the front brakes remain effective. Which control function should be investigated?

- A. Rear-brake proportioning or load-sensitive pressure control
- B. A/C compressor cycling
- C. Engine oil pressure relief
- D. Starter pinion engagement

50. A master cylinder applies 120 pounds of force to a 1-square-inch piston. Ignoring losses, what hydraulic pressure is produced?

- A. 60 psi
- B. 1 psi
- C. 240 psi
- D. 120 psi

51. What feature of a disc-brake caliper helps pull the piston back slightly after the pedal is released?

- A. The rotor cooling vanes

- B. The parking-brake warning switch
- C. Elastic action of the square-cut piston seal
- D. The wheel-speed sensor magnet

52. What is the purpose of the check valve in a vacuum brake-booster supply line?

- A. Increase brake-fluid boiling point
- B. Retain booster vacuum when source vacuum falls
- C. Control alternator field current
- D. Adjust rear toe

53. Brake fluid in the reservoir is slightly below its previous level, and all pads are heavily worn with no leaks found. What can explain the lower level?

- A. Wheel toe changed the fluid volume
- B. Caliper pistons have moved outward as the pads wore
- C. The radiator cap vented the reservoir
- D. The alternator consumed brake fluid

54. A brake rotor is cracked through a friction surface. What is the appropriate service action?

- A. Bleed only the opposite brake
- B. Adjust ignition timing
- C. Increase tire pressure
- D. Replace the cracked brake rotor

55. Brake lamps remain on continuously even though the pedal returns fully. Which item should be checked first?

- A. Differential backlash
- B. Thermostat opening temperature

- C. Brake-pedal switch adjustment or switch operation
- D. Fuel injector balance

56. Front tire tread feels feathered across the ribs, with each rib smooth on one edge and sharp on the other. Which alignment angle is most suspect?

- A. Incorrect toe setting
- B. Caster only
- C. Wheel offset only
- D. Steering-axis inclination only

57. A tire shows alternating high and low scalloped wear around its circumference. Which condition commonly contributes?

- A. A stuck-open thermostat
- B. Weak shock absorbers or an out-of-balance wheel
- C. A rich fuel mixture
- D. An open starter solenoid

58. Both front tires are wearing heavily on their inner shoulders. Which alignment condition can contribute?

- A. Excessive negative camber or excessive toe-out
- B. A low refrigerant charge
- C. Excessive positive camber only
- D. A weak fuel pump

59. A vehicle wanders and does not return strongly to straight ahead after a turn. Which alignment factor may be too low?

- A. Fuel injector resistance

- B. Brake-fluid level
- C. Alternator ripple
- D. Positive caster

60. After a toe adjustment, total toe is correct but the steering wheel is off-center on a straight road. What was likely done incorrectly?

- A. The radiator cap was loose
- B. The battery was undercharged
- C. Unbalanced tie-rod adjustment with the rack off-center
- D. The rear brake shoes were overadjusted

61. Power-steering fluid appears foamy and the pump whines after a hose replacement. What condition is most likely?

- A. Excessive brake-fluid moisture
- B. A clogged catalytic converter
- C. A weak ignition coil
- D. Air trapped in the hydraulic steering system

62. Steering effort is very high at idle but becomes much easier when engine speed is raised. Which fault is likely?

- A. Low power-steering pump output at idle
- B. A stuck-open EGR valve
- C. A worn oxygen sensor
- D. Excessive battery reserve capacity

63. A front wheel has noticeable looseness at both the 12-and-6 and 3-and-9 o'clock positions, while steering linkage is tight. What should be suspected?

- A. A clogged fuel filter
- B. Wheel-bearing or hub looseness
- C. A failed brake-light switch
- D. Excessive A/C head pressure

64. A humming noise from the front becomes louder when the vehicle is turned left and quieter when turned right. What is a likely cause?

- A. A leaking heater core
- B. A worn wiper blade
- C. A loaded wheel bearing on the right side
- D. A weak starter relay

65. A front-wheel-drive vehicle clicks repeatedly during sharp turns under power. Which component is most likely worn?

- A. A radiator pressure cap
- B. An alternator rectifier
- C. A brake booster check valve
- D. An outer constant-velocity joint

66. A front-wheel-drive vehicle shudders mainly during acceleration but becomes smooth while coasting at the same road speed. Which fault is plausible?

- A. A cabin air filter restriction
- B. A brake-fluid leak at the master cylinder
- C. Wear in an inner CV joint
- D. A headlamp ground fault

67. One corner of a vehicle sits noticeably lower than the others with the vehicle unloaded. What component should be inspected first?

- A. The fuel-pressure regulator
- B. The low-corner spring and mounting
- C. The starter armature
- D. The oxygen sensor heater

68. After the body is pushed down and released, a vehicle continues bouncing through several oscillations. What does this suggest?

- A. Weak shock absorbers or struts
- B. A blocked fuel return line
- C. Excessive alternator output
- D. A stuck brake switch

69. A tire is set to 35 psi cold and reads somewhat higher after extended highway driving. What is the best interpretation?

- A. The wheel bearing has certainly failed
- B. The alignment has changed to excessive caster
- C. The tire must immediately be deflated to 35 psi while hot
- D. Pressure normally rises as the tire warms during operation

70. A vehicle consistently drifts right. After the two front tires are swapped side to side, it drifts left. What is the most likely source?

- A. A low coolant level
- B. A tire-related radial pull or conicity condition
- C. A fixed frame alignment problem
- D. A failed alternator diode

71. Automatic-transmission fluid is dark, smells burned, and the transmission slips under load. What internal condition is likely?

- A. A clean air filter
- B. A fully charged battery
- C. Overheated or worn friction elements such as clutch packs
- D. A new brake rotor

72. Automatic-transmission line pressure is low in every selector range and fluid level is correct. Which common source should be investigated?

- A. Pump output, filter restriction, or pressure-regulator fault
- B. Alternator field current
- C. Wheel camber
- D. Radiator cap spring pressure

73. A vehicle shudders only as the torque-converter clutch applies during steady cruise, then becomes smooth when lockup is commanded off. What is likely?

- A. A loose wheel cover
- B. Torque-converter clutch friction or control problem
- C. A thermostat stuck open
- D. A burned headlamp bulb

74. An automatic transmission makes a high-pitched whine in Park that rises directly with engine rpm. Which component is a likely source?

- A. The transmission front pump
- B. The rear shock absorbers
- C. The differential side gears
- D. The park-brake cable

75. A manual transmission grinds when selecting reverse or first gear while stopped, but shifts normally with the engine off. What is most likely?

- A. The thermostat is opening early
- B. The alternator is undercharging
- C. The driveshaft is perfectly balanced
- D. The clutch is not fully releasing

76. Engine speed rises during hard acceleration but vehicle speed does not increase proportionally in a manual-transmission vehicle. What should be suspected?

- A. A clogged heater core
- B. A seized brake-light switch
- C. A slipping clutch disc or weak pressure plate
- D. A weak battery cable

77. A clunk is felt when shifting from Reverse to Drive, and inspection shows excessive looseness in a driveshaft universal joint. What is the likely repair area?

- A. The brake master cylinder
- B. The evaporative canister
- C. The radiator thermostat
- D. The worn universal joint and related driveline connections

78. A rear axle produces a gear howl mainly on deceleration, and the noise changes with drive versus coast load. What should be inspected?

- A. Front brake fluid level
- B. A/C evaporator temperature
- C. Ring-and-pinion contact pattern, backlash, and pinion bearings
- D. Fuel injector pulse width

79. A part-time four-wheel-drive vehicle binds and hops during tight turns on dry pavement. What is the most likely reason?

- A. The alternator is charging normally
- B. Part-time 4WD is engaged on a high-traction surface
- C. The radiator fan is running
- D. The brake lamps are on

80. A differential has 41 ring-gear teeth and 10 pinion teeth. What is the approximate final-drive ratio?

- A. 4.10:1
- B. 3.10:1
- C. 5.10:1
- D. 2.44:1

81. An infrared thermometer shows several radiator tubes remain much cooler than neighboring tubes after the engine reaches temperature. What does this suggest?

- A. A new brake booster
- B. Restricted coolant flow through portions of the radiator
- C. A fully charged battery
- D. Correct wheel alignment

82. The upper radiator hose collapses as the engine cools after shutdown. Which component should be checked?

- A. The pressure cap vacuum-return valve and hose integrity
- B. The starter relay contacts
- C. The rear axle bearings
- D. The parking-brake warning switch

83. A thermostatic fan clutch spins almost freely when the engine is very hot and airflow is needed. What fault is likely?

- A. The fuel injectors are overpressurized
- B. The alternator belt is too tight
- C. The fan clutch is not engaging adequately when hot
- D. The brake rotor is too thick

84. A vehicle overheats only in slow traffic, but runs at normal temperature at highway speed. The electric radiator fan never turns on. What should be checked?

- A. Transmission output-shaft seal
- B. Starter pinion depth
- C. Rear wheel alignment only
- D. The electric cooling-fan circuit and command

85. Fuel pressure falls rapidly after shutdown. No injector leaks are found. Which component can allow pressure to bleed back toward the tank?

- A. A worn brake pad
- B. A weak shock absorber
- C. A leaking pump check valve or pressure-regulator path
- D. A seized steering knuckle

86. Injector command is present and normal, but fuel pressure is far below specification under load. What should be tested next?

- A. Brake-booster pushrod length
- B. Wheel-bearing end play
- C. A/C blend-door position
- D. Fuel-pump delivery, filter restriction, and supply voltage

87. An evaporative-emissions purge valve is stuck open. Which complaint can occur, especially after refueling?

- A. Hard starting from excessive purge-vapor flow
- B. A low brake-fluid level
- C. A high alternator ripple only
- D. A worn outer tie-rod end

88. Upstream and downstream oxygen-sensor waveforms closely mirror each other after the catalyst is hot. What can this indicate?

- A. A correctly isolated downstream sensor
- B. Reduced catalytic-converter oxygen-storage efficiency
- C. Excessive wheel caster
- D. A restricted heater core

89. An A/C system has unusually high high-side pressure and unusually low low-side pressure while the compressor runs. Which condition is likely?

- A. A restriction near the metering device or liquid line
- B. Low engine compression on one cylinder
- C. An open brake-light fuse
- D. A completely slipping serpentine belt with no compressor drive

90. Both A/C high-side and low-side pressures are lower than expected, and vent temperature is warm. What is a common cause?

- A. An overfilled brake reservoir
- B. A shorted starter cable
- C. A low refrigerant charge
- D. Excessive positive toe

91. A service procedure identifies certain cylinder-head bolts as torque-to-yield and specifies replacement after removal. What should the technician do?

- A. Tighten them only by feel
- B. Install new bolts and follow the specified tightening sequence
- C. Reuse the old bolts indefinitely if they look clean
- D. Lubricate every bolt regardless of the procedure

92. A scan tool stores freeze-frame data with a diagnostic trouble code. Why is that information useful?

- A. It automatically adjusts wheel alignment
- B. It permanently repairs the fault
- C. It proves the named sensor must be replaced
- D. It records operating conditions present when the fault was detected

93. An intermittent sensor dropout happens too quickly for a digital meter display to show clearly. Which tool is best for capturing the event?

- A. A tire tread-depth gauge
- B. A brake spoon
- C. A lab scope or graphing oscilloscope
- D. A coolant hydrometer

94. Why is a high-impedance digital voltmeter generally preferred when testing sensitive electronic control circuits?

- A. It minimizes the current drawn from the circuit being measured
- B. It bypasses every fuse automatically
- C. It changes analog sensors into digital sensors
- D. It increases circuit load to maximum current

95. What is an advantage of using an inductive current clamp during diagnosis?

- A. It measures coolant concentration directly

- B. Current can be measured without opening the conductor path
- C. It mechanically tests brake rotor runout
- D. It sets wheel camber automatically

96. A technician is tracing a short in a complex harness. Why should the factory wiring diagram be consulted?

- A. It eliminates the need for voltage testing
- B. It changes the fuse rating automatically
- C. It guarantees the damaged wire is visible
- D. It identifies circuit paths, connectors, splices, grounds, and shared loads

97. A scan tool reports DTC P0302. What does the code establish by itself?

- A. The transmission is slipping in second gear
- B. The engine must have a cracked block
- C. The cylinder-2 spark plug is definitely defective
- D. Cylinder 2 has a detected misfire

98. A technician spends 1.3 hours diagnosing a fault and 2.4 hours completing the repair. What total labor time is recorded?

- A. 1.1 hours
- B. 2.8 hours
- C. 3.7 hours
- D. 4.7 hours

99. After repairing an intermittent wiring fault, what is the best final step before returning the vehicle to service?

- A. Disconnect the battery so no further data can be stored

- B. Recheck operation under the conditions that produced the complaint and rescan as appropriate
- C. Erase all codes without testing
- D. Install a larger fuse for added protection

100. A fastener specification calls for 90 N·m, but a technician tightens it to only 60 N·m. What percentage of the specified torque was applied?

- A. About 67%
- B. 33%
- C. 100%
- D. 150%

Practice Exam 9: Answer Key and Explanations

1. A — Worn piston rings or cylinder-wall sealing: air entering the crankcase during leak-down shows pressure passing the piston and ring seal. Valve leakage would be heard at the intake or exhaust, while ignition and catalyst faults do not create crankcase leakage. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

2. C — A valve that is burned, sticking, or not seating: rapid vacuum fluctuation synchronized with engine operation often points to a valve-sealing problem on one cylinder. Cooling, charging, and wheel-bearing faults do not create a repeating intake-vacuum pulse tied to one cylinder. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

3. B — Camshaft-to-crankshaft timing alignment: uniformly low compression after timing work can occur when valve timing is shifted enough to reduce cylinder filling and effective compression. Fuel, brake, and charging measurements do not explain a simultaneous mechanical compression change across every cylinder. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

4. D — Excessive bearing clearance in the lubricated engine parts: hot oil is thinner, so excessive internal clearance can allow greater leakage and reduce pressure once the engine warms. Cabin filters, parking brakes, and horn circuits do not control the clearances that maintain engine oil pressure. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

5. D — Lifter bleed-down or delayed oil supply to the valve train: a lifter that loses its oil charge or receives delayed lubrication can create temporary valve-train clearance and tapping after startup. Alignment, refrigerant, and battery capacity do not directly determine hydraulic-lifter filling or valve-

train lash. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

6. B — Bent valves from piston-to-valve contact: an interference design allows pistons and open valves to occupy overlapping space at different times, so lost synchronization can cause contact. Electrical state, brake rotors, and steering attachments are unrelated to the internal collision created by failed valve timing. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

7. A — Worn valve-stem seals or guides: extended idle produces high intake vacuum that can draw oil past worn valve guides or stem seals, then acceleration burns the accumulated oil. Fuel restriction, stop-lamp wiring, and wheel alignment cannot account for the characteristic oil-burning smoke pattern. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

8. C — Coolant entering a combustion chamber: persistent sweet-smelling white exhaust combined with coolant loss strongly suggests coolant is entering combustion and leaving through the exhaust. Oil viscosity, charging output, and brake drag cannot directly consume coolant or create glycol-related exhaust vapor. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

9. A — An excessively rich air-fuel mixture: black smoke and fuel-fouled plugs indicate more fuel is being delivered than the available air can burn efficiently. A lean condition reduces fuel delivery, while suspension and steering faults do not change combustion mixture strength. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

10. C — Compare the power contribution of individual cylinders: a cylinder-balance test compares the speed change caused by disabling each cylinder, revealing one that contributes less torque than the others. Cooling pressure, wheel dimensions, and refrigerant identification require unrelated tools and do not measure cylinder contribution. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

11. B — Excessive combustion temperature from a lean or overheated condition: overheating or an excessively lean mixture can raise plug temperature enough to blister the insulator and damage electrodes. Rich operation more often leaves dark deposits, and tire or wiper problems cannot alter combustion-chamber plug temperature. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

12. D — The mixture begins burning before the commanded spark because of a hot spot: preignition starts combustion before the intended spark event because a glowing deposit or overheated surface ignites the mixture early. Exhaust timing, starter operation, and fuel-pump control describe different mechanisms and do not define abnormal early combustion. Confirm the diagnosis with the appropriate test before replacing parts, then.

13. D — Increased crankcase pressure and oil leakage: without normal PCV flow, combustion blow-by gases can raise crankcase pressure and force oil past gaskets or seals. Brake assist, alternator output

frequency, and tire resistance are unrelated to crankcase vapor evacuation. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

14. B — Slow engine warm-up and weak heater output: an open thermostat allows coolant to circulate through the radiator too soon, delaying normal operating temperature and reducing available heater-core heat. It does not cause immediate cold-start overheating, axle noise, or hydraulic brake symptoms. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

15. C — Glow-plug operation and cold-start heating: insufficient glow-plug heating can leave cold diesel chambers unable to ignite injected fuel promptly, producing hard starting and temporary white unburned-fuel smoke. Brake, alignment, and belt-tracking faults do not provide the chamber heat needed for cold diesel ignition. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

16. A — A cylinder that requires less compression work than the others: each compression stroke loads the starter; a weak cylinder creates a smaller repeating load change that can be compared with the other cylinders. Coolant concentration, bearing adjustment, and refrigerant-oil identification require different measurements and cannot be read from cranking load.

17. C — Reduced valve lift and poor cylinder breathing: a worn cam lobe cannot open its valve to the intended lift, restricting airflow into or out of that cylinder and reducing power. Fuel pressure, battery capacity, and suspension geometry are controlled by separate components and do not restore valve lift. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

18. B — A valve may fail to seat fully and lose compression: insufficient lash leaves inadequate expansion clearance; as parts grow with heat, a valve can be held slightly open and lose sealing. Charging, hydraulic brakes, and tire construction do not depend on mechanical valve clearance. A confirming mechanical or scan-data check should support the same diagnosis before parts are replaced.

19. D — Engine and transmission mounts: steady rpm and no recorded misfire make an engine-combustion fault less likely, while collapsed mounts can transmit normal engine vibration directly into the body. Emission heaters, brake proportioning, and axle ratio do not isolate powertrain vibration from the chassis. Corroborating the symptom with the appropriate mechanical test helps separate cause from coincidence.

20. A — A timing belt or chain that no longer drives the camshaft correctly: loss of camshaft synchronization can leave valves opening at the wrong time or not operating, sharply reducing compression and cranking resistance. Fuel restriction affects running, a weak battery slows cranking, and a CV joint cannot remove compression from every cylinder.

21. A — 24 volts: series-connected battery voltages add, so two 12-volt sources provide a nominal total of 24 volts across the outside terminals. The other values result from treating series voltage incorrectly or multiplying beyond the actual two-source arrangement. A follow-up voltage, current, or continuity check should confirm the electrical path before component replacement.

22. C — System voltage remains about 12 volts while available capacity increases: parallel sources share the same positive and negative nodes, so voltage remains the same while current and capacity capability can increase. Series connection raises voltage; halving the voltage and producing AC do not describe ordinary parallel battery operation. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

23. D — The alternator and regulator are maintaining normal charging voltage: a mid-14-volt reading under load is consistent with a functioning charging system on a typical 12-volt vehicle. A single normal charging reading does not prove the unrelated starter or ABS conditions and does not indicate an open battery. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

24. B — 2 amp-hours: amp-hours equal current multiplied by time, so 0.25 ampere for 8 hours removes about 2 amp-hours from the battery. The other values come from dividing, ignoring time, or multiplying the quantities incorrectly. Testing the circuit under load is important because resistance faults can disappear when little current is flowing.

25. D — Excessive resistance in the positive cable or its connections: a loaded starter cable should lose very little voltage; a large drop means resistance is consuming voltage before it reaches the starter. Cooling-system level and brake drag are unrelated, and a high measured drop is not evidence of a healthy low-resistance cable.

26. B — A short to ground or severe overload downstream of the fuse: an immediate repeated fuse opening indicates current far above the circuit design, commonly from a direct short or overloaded component. An open circuit carries little or no current, while battery state and thermostat position do not explain repeated fuse overcurrent.

27. A — Relay contact resistance or burned load contacts: a relay coil can operate and click even when the internal load contacts are burned, pitted, or too resistive to carry current. Compression, tires, and brake-fluid condition do not interrupt the relay contact path supplying an electrical load. A follow-up voltage, current, or continuity check should confirm the electrical path before component replacement.

28. C — Primarily in one direction and block in the opposite direction: a semiconductor diode is designed for one-way conduction, so forward and reverse checks should produce clearly different readings. Equal conduction suggests a shorted diode, while no conduction in either direction suggests an open device. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after the.

29. A — A failed rectifier diode or stator-related charging fault: alternator rectifier problems allow more alternating-current ripple to remain on the DC charging output even when average voltage appears acceptable. Steering, heating, and parking-brake components cannot create AC ripple in the charging waveform. A follow-up voltage, current, or continuity check should confirm the electrical path before component replacement.

30. D — Mechanical drag or an internally shorted starter motor: high current with slow rotation means the starter is heavily loaded mechanically or has internal electrical faults that reduce efficient torque

production. An open circuit would reduce current, and the sensor or washer system cannot create excessive starter draw. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

31. B — An open or poor internal starter-motor connection: low current despite available terminal voltage points toward an open brush, winding, or internal connection that prevents normal current flow. Mechanical drag and armature shorts usually increase current, while differential fluid level has no direct effect on starter continuity. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

32. C — A weak or defective cell in the battery: one cell remaining substantially lower than its neighbors after charging indicates that cell is not accepting or retaining charge normally. A healthy battery should have reasonably consistent cell readings, and fuel or alignment faults cannot create one-cell electrolyte imbalance. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

33. D — Current stops through the entire series path: a series circuit has one continuous current path, so an open anywhere interrupts current through every load in that path. The open does not create AC or increase current; it removes continuity required for charge flow. A follow-up voltage, current, or continuity check should confirm the electrical path before component replacement.

34. A — 5 amperes: source current in a parallel circuit equals the sum of the branch currents, so 2 amperes plus 3 amperes equals 5 amperes. The other choices come from subtracting, averaging, or multiplying instead of adding branch current. Testing the circuit under load is important because resistance faults can disappear when little current is flowing.

35. C — A digital switching signal that changes between voltage levels: Hall-effect position sensors typically switch an electronic output as a target passes, creating a digital pulse train the control module can interpret. Hydraulic pressure, fixed resistance, and mechanical cable movement are not the normal output format of an electronic Hall sensor.

36. B — Resistance decreases as temperature rises: an NTC thermistor is designed so electrical resistance falls as temperature increases, allowing the control module to infer coolant temperature from circuit voltage. Infinite resistance indicates an open circuit, and the other descriptions do not represent normal thermistor behavior. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after the.

37. B — Excess voltage can damage sensors or the control module reference circuit: a low-voltage reference circuit is designed around approximately five volts, so battery voltage can overstress connected electronics and the module driver. Grounding, hydraulic braking, and alignment geometry are separate systems and are not the direct effect of overvolting a sensor reference.

38. A — Excessive resistance in the ground side of the lamp circuit: a loaded ground should have very little voltage difference from battery negative; 1.5 volts shows unwanted resistance consuming voltage on the return path. Cooling and transmission faults cannot create a ground-side voltage drop at a

headlamp. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

39. D — The shared ground connection for high resistance: multiple loads using a poor common ground can raise return-path voltage when total current increases, causing one lamp to dim as another load operates. Valve clearance, rotor dimensions, and fuel pressure do not explain load-dependent voltage loss at a shared electrical ground. Confirm the diagnosis with the appropriate test before replacing parts, then.

40. C — 60 watts: electrical power equals voltage multiplied by current, so 12 volts times 5 amperes equals 60 watts. The other values come from dividing or using unrelated arithmetic instead of the power relationship. Testing the circuit under load is important because resistance faults can disappear when little current is flowing.

41. A — Internal bypass leakage in the master cylinder: worn master-cylinder seals can allow fluid to bypass internally between pressure chambers, causing pedal travel without an external leak. Wheel bearings, injectors, and alternator belts cannot make hydraulic pressure bleed internally while the pedal is held. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

42. C — A restricted flexible brake hose trapping hydraulic pressure: if opening the bleeder releases the brake, trapped hydraulic pressure exists upstream of the caliper; a damaged hose can act like a one-way restriction. Steering, compression, and oxygen-sensor faults cannot hold brake-fluid pressure at one wheel. Brake diagnosis should confirm hydraulic, mechanical, and assist operation before the vehicle is returned to service.

43. D — Brake rotor thickness variation or lateral runout: rotor dimensional variation changes braking force once per wheel revolution and can transmit a repeating pulsation through the hydraulic system. Steering fluid, battery condition, and cabin filtration do not produce a speed-related brake-pedal pulse. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

44. B — A wheel-speed sensor signal dropping out at low speed: a weak sensor signal, excessive air gap, or damaged tone ring can make one wheel appear to stop early, prompting unwanted ABS intervention. Cooling, fuel mixture, and engine mounts do not provide wheel-speed data to the ABS controller. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

45. C — The hydraulic power-steering pump and its drive: hydro-boost and hydraulic power steering can share pump pressure, so losing that source can remove assist from both systems at once. Lighting and engine or cabin sensors do not supply the hydraulic pressure used for steering and brake assist. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

46. A — Rubber hydraulic seals can swell and deteriorate: petroleum contamination can attack brake-system rubber components, causing swelling, sticking, leakage, and widespread hydraulic damage that may require extensive service. Rotor size and alignment geometry do not change from fluid

contamination, and electrical conductivity is not the principal safety issue. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

47. D — Parking-brake cable adjustment and rear mechanism clearance: excessive parking-brake travel commonly results from cable stretch, poor adjustment, or excessive clearance in the mechanical rear brake components. Charging, fuel, and ignition settings do not determine the lever travel of a mechanical parking-brake system. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

48. B — Retract the shoes away from the drum when hydraulic pressure is released: return springs pull the brake shoes back after the wheel cylinder relaxes, reducing drag and restoring running clearance. Master-cylinder dimensions, bearing preload, and engine vacuum are controlled elsewhere and are not functions of the drum-brake springs. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

49. A — Rear-brake proportioning or load-sensitive pressure control: rear proportioning limits hydraulic pressure so lightly loaded rear tires do not receive more braking force than available traction can support. Starting, lubrication, and air-conditioning controls do not distribute front-to-rear brake pressure. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

50. D — 120 psi: hydraulic pressure equals applied force divided by piston area, so 120 pounds over 1 square inch produces 120 pounds per square inch. The other values come from halving, doubling, or ignoring the force-to-area relationship. Brake diagnosis should confirm hydraulic, mechanical, and assist operation before the vehicle is returned to service.

51. C — Elastic action of the square-cut piston seal: the square-cut seal twists slightly as the piston moves outward and then relaxes, retracting the piston enough to reduce pad drag. Cooling vanes, speed sensors, and warning switches do not provide normal caliper-piston retraction. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

52. B — Preserve booster vacuum when engine vacuum falls or the engine stops: the one-way check valve stores vacuum in the booster so some assist remains when manifold vacuum temporarily drops or the engine stops. Brake-fluid properties, alignment, and charging regulation are unrelated to booster vacuum retention. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after.

53. B — Caliper pistons have moved outward as the pads wore: as disc pads wear, caliper pistons remain farther outward and more hydraulic fluid stays in the caliper bores, lowering the reservoir level. Electrical, alignment, and cooling components do not store brake fluid or explain this gradual wear-related change. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

54. D — Replace the rotor rather than machining the crack away: a structural crack compromises rotor integrity and cannot be safely corrected by resurfacing; the damaged rotor should be replaced and

related causes inspected. Tire, bleeding, and ignition adjustments do not restore the strength of a cracked brake component. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

55. C — Brake-pedal switch adjustment or switch operation: the stop-lamp switch is actuated by pedal position; incorrect adjustment or a stuck switch can keep the circuit closed after the pedal returns. Axle gears, engine cooling, and injector balance do not directly control the brake-lamp electrical circuit. Because braking is safety-critical, the repair should be verified for correct pressure release and balanced operation.

56. A — Incorrect toe setting: toe error makes the tires scrub sideways as they roll, commonly creating a feathered wear pattern across the tread ribs. Caster, steering-axis inclination, and wheel offset can affect handling or geometry but are less characteristic of this specific feathering pattern. Inspection should confirm the wear pattern and mechanical condition before alignment or parts replacement is finalized.

57. B — Weak shock absorbers or an out-of-balance wheel: cupping or scalloping develops when the tire repeatedly loses consistent contact or experiences uncontrolled vertical motion, often from poor damping or imbalance. Cooling, mixture, and starting faults do not cause the repeating mechanical tread pattern around a tire. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after.

58. A — Excessive negative camber or excessive toe-out: inner-edge wear can result when the tire tops lean inward too far or when toe causes the tires to scrub outward across the road. Positive camber tends toward outer-edge wear, while refrigerant and fuel systems cannot change tire contact geometry. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

59. D — Positive caster: positive caster helps provide directional stability and steering return by placing the steering axis so tire forces tend to center the wheels. Brake, charging, and injector conditions do not create the geometric self-centering effect of caster. Road-test behavior and physical inspection together help separate tire forces from fixed suspension or steering faults.

60. C — Tie-rod adjustments were not balanced with the steering gear centered: total toe can meet specification while the steering wheel remains crooked if one tie rod is lengthened and the other shortened unequally around an off-center rack. Battery, cooling, and rear-brake adjustments do not determine steering-wheel center during front toe setting.

61. D — Air trapped in the hydraulic steering system: air entrained in power-steering fluid causes aeration, noise, and inconsistent assist, especially after the system has been opened for service. Brake-fluid condition, exhaust restriction, and ignition output cannot create foam in the steering reservoir. Road-test behavior and physical inspection together help separate tire forces from fixed suspension or steering faults.

62. A — A weak power-steering pump or low pump output at idle: a worn hydraulic pump may not produce enough flow or pressure at low speed, yet improve as pump speed increases with engine rpm.

Battery capacity and engine-emission controls do not directly determine hydraulic steering assist at idle. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

63. B — Wheel-bearing or hub looseness: play in multiple directions with tight steering linkage points toward looseness at the wheel bearing or hub rather than a single tie-rod joint. Fuel, refrigerant, and lighting faults cannot create mechanical wheel movement at the hub. Road-test behavior and physical inspection together help separate tire forces from fixed suspension or steering faults.

64. C — A loaded wheel bearing on the right side: cornering transfers load between wheel bearings; a damaged bearing often becomes noisier when vehicle weight increases on that side. Wipers, heater cores, and starter relays do not produce road-speed hum that changes with lateral wheel loading. Inspection should confirm the wear pattern and mechanical condition before alignment or parts replacement is finalized.

65. D — An outer constant-velocity joint: outer CV joints operate at large articulation angles during turns, and worn joint tracks commonly produce rhythmic clicking under torque. Cooling caps, brake vacuum valves, and alternator diodes cannot create a turn-dependent driveline click. Road-test behavior and physical inspection together help separate tire forces from fixed suspension or steering faults.

66. C — Wear in an inner CV joint or related drive axle joint: inner CV joints carry torque while accommodating suspension movement; wear can produce acceleration-related shudder that diminishes when torque is removed. Cabin airflow, brake hydraulics, and headlamp wiring do not create a torque-sensitive axle vibration. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after.

67. B — The spring at the low corner and its mounting: ride height is primarily supported by the springs, so a broken, sagged, or improperly seated spring can lower one corner and alter alignment. Engine electronics and starting or fuel components do not carry static vehicle weight at one suspension corner. Confirm the diagnosis with the appropriate test before replacing parts, then.

68. A — Weak shock absorbers or struts: springs store and release energy, while shocks or struts damp that motion; repeated bouncing shows inadequate damping control. Charging, fuel-return, and stop-lamp faults do not control suspension oscillation after the body is released. Inspection should confirm the wear pattern and mechanical condition before alignment or parts replacement is finalized.

69. D — Pressure normally rises as the tire warms during operation: air temperature inside the tire rises during driving, increasing pressure; cold inflation specifications are intended to be checked before substantial heating. Bleeding a hot tire can leave it underinflated when cold, and the pressure rise alone does not prove bearing or alignment failure.

70. B — A tire-related radial pull or conicity condition: a pull that reverses when front tires are exchanged strongly implicates a tire force characteristic rather than a fixed vehicle geometry problem. Electrical and cooling faults cannot reverse the direction of drift when only tire positions are changed. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after.

71. C — Overheated or worn friction elements such as clutch packs: burned fluid and slipping indicate excessive heat and inadequate friction holding capacity, commonly from worn clutches, low pressure, or prolonged internal slip. Brake, battery, and intake-filter conditions do not create burned transmission fluid or loss of clutch holding force. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

72. A — Pump output, filter restriction, or pressure-regulator fault: low pressure across all ranges points to a common hydraulic supply problem rather than a single clutch or band apply circuit. Alignment, charging, and cooling-system cap pressure do not generate automatic-transmission line pressure. Confirming when the symptom occurs—under drive, coast, shift, or lockup load—helps isolate the responsible component.

73. B — Torque-converter clutch friction or control problem: a shudder that appears specifically during converter clutch apply and disappears when lockup is disabled isolates the symptom to TCC engagement or its hydraulic control. Wheel covers, thermostat position, and lighting faults do not follow torque-converter lockup commands. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after the.

74. A — The transmission front pump: the front pump turns with the engine whenever the converter drives it, so pump wear or cavitation can produce an rpm-related whine even in Park. Differential gears, parking cables, and shocks are not rotating with engine speed while the vehicle is stationary. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

75. D — The clutch is not fully releasing: if the clutch drags, the transmission input shaft continues turning with the engine and makes non-synchronized or low-speed gear engagement difficult. With the engine off the shaft stops, which explains the easier shift and points away from charging or cooling faults. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

76. C — A slipping clutch disc or weak pressure plate: a clutch that cannot hold engine torque allows the crankshaft and flywheel to accelerate without transferring the same increase through the drivetrain. Lighting, heating, and battery-cable faults do not create engine-speed flare specifically under mechanical drivetrain load. Confirming when the symptom occurs—under drive, coast, shift, or lockup load—helps isolate the responsible component.

77. D — The worn universal joint and related driveline connections: excessive U-joint clearance allows driveline parts to take up slack abruptly when torque direction changes, producing a clunk. Evaporative, cooling, and brake-hydraulic components do not create rotational clearance in the driveshaft. Fluid condition, load response, and component play should agree with the diagnosis before internal repair is authorized.

78. C — Ring-and-pinion contact pattern, backlash, and pinion bearings: differential gear noise that changes between drive and coast often reflects ring-and-pinion setup or bearing conditions that alter the tooth contact pattern. Fuel, brake-fluid, and HVAC measurements do not change with torque direction through the rear axle gears. Confirming when the symptom occurs—under drive, coast, shift, or lockup load—helps isolate the responsible component.

79. B — Part-time 4WD is engaged on a high-traction surface: part-time systems can lock front and rear driveline speeds together without a center differential, so tire-speed differences in a dry turn create windup and binding. Cooling, charging, and lighting operation do not mechanically lock front and rear driveline rotation. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal.

80. A — 4.10:1: final-drive ratio equals ring-gear teeth divided by pinion teeth, so 41 divided by 10 equals 4.10 to 1. The other values come from reversing the division or using incorrect tooth-count arithmetic. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after the repair. The measured evidence should match the expected system behavior.

81. B — Restricted coolant flow through portions of the radiator: cold spots among otherwise hot radiator passages indicate blocked or restricted tubes that are not receiving normal coolant flow. Battery, alignment, and brake-assist conditions cannot create a localized radiator temperature pattern. A second system measurement should confirm the suspected restriction, leak, control fault, or loss of capacity.

82. A — The pressure cap vacuum-return valve and hose integrity: as coolant contracts during cool-down, the cap must allow coolant or air to return so excessive vacuum does not collapse the hose. Starter, axle, and parking-brake components do not regulate pressure recovery in the cooling system. Pressure, temperature, flow, and scan data should be compared with specification before replacing a major component.

83. C — The fan clutch is not engaging adequately when hot: a thermostatic clutch should increase fan engagement as air leaving the radiator becomes hot; freewheeling under those conditions indicates inadequate coupling. Fuel, brake, and charging-belt conditions do not determine thermal engagement of the engine cooling fan clutch. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation.

84. D — The fan motor, relay, fuse, command circuit, and temperature input: highway airflow can cool the radiator without the fan, while low-speed operation depends heavily on electric-fan airflow, making the inoperative fan circuit a prime suspect. Alignment, starter geometry, and transmission seals do not supply radiator airflow at idle. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

85. C — A leaking pump check valve or pressure-regulator path: residual fuel pressure depends on the pump check valve, regulator arrangement, injectors, and sealed lines; if injectors are dry, backflow becomes a logical next area. Steering, brakes, and suspension cannot release pressure from the closed fuel rail. Confirm the diagnosis with the appropriate test before replacing parts, then verify normal operation after.

86. D — Fuel-pump delivery, filter restriction, and supply voltage: normal injector command cannot compensate for inadequate rail pressure; pump capacity, restrictions, and electrical supply must be checked under load. Wheel, brake-assist, and HVAC-door conditions do not create low fuel-rail pressure during acceleration. Pressure, temperature, flow, and scan data should be compared with specification before replacing a major component.

87. A — Hard starting or rough running from excess fuel vapor entering the intake: a purge valve stuck open can allow uncontrolled vapor flow into the intake, creating an overly rich or unstable mixture during starting or idle. Brake-fluid, steering, and charging faults do not meter fuel vapor from the charcoal canister into the engine.

88. B — Reduced catalytic-converter oxygen-storage efficiency: a healthy catalyst smooths oxygen-content changes, so a downstream sensor that closely follows the upstream waveform can indicate poor catalyst storage and conversion activity. Alignment and heater flow cannot make the downstream exhaust sensor mimic the upstream switching pattern. Pressure, temperature, flow, and scan data should be compared with specification before replacing a major component.

89. A — A restriction near the metering device or liquid line: a restriction can starve the evaporator and lower suction pressure while refrigerant backs up on the high side, raising discharge pressure. No compressor drive tends to equalize pressures, and brake or compression faults do not create this refrigeration pressure split. Confirm the diagnosis with the appropriate test before replacing parts, then.

90. C — A low refrigerant charge: insufficient refrigerant mass commonly lowers system pressures and reduces evaporator cooling capacity, producing warm outlet air. Brake-fluid level, wheel alignment, and starter wiring are unrelated to the refrigerant pressure and heat-transfer cycle. Pressure, temperature, flow, and scan data should be compared with specification before replacing a major component.

91. B — Install new bolts and follow the specified tightening sequence: torque-to-yield fasteners are intentionally stretched into a controlled range and may not provide repeatable clamping if reused when replacement is specified. Appearance and feel cannot substitute for the service procedure, and lubrication must follow rather than override the specified instructions. Confirm the diagnosis with the appropriate test before replacing parts, then.

92. D — It records operating conditions present when the fault was detected: freeze-frame data can show load, temperature, speed, rpm, and other values captured when the code set, helping reproduce or narrow the failure. It is diagnostic evidence, not a repair command, parts verdict, or chassis-adjustment function. Following service information and verifying the final result reduces repeat repairs and protects surrounding components.

93. C — A lab scope or graphing oscilloscope: an oscilloscope displays voltage over time with enough resolution to reveal brief dropouts, spikes, or waveform distortion that a slower numerical display may miss. Tire, brake-adjusting, and coolant tools cannot capture fast electrical signal changes. Good diagnostic practice records evidence, compares it with specification, and verifies the completed repair.

94. A — It minimizes the current drawn from the circuit being measured: high input impedance lets the meter observe circuit voltage while drawing very little current, reducing the chance of altering or damaging low-current electronic signals. Heavy loading, fuse bypassing, and sensor conversion are not purposes of a diagnostic voltmeter. Confirm the diagnosis with the appropriate test before replacing parts, then verify.

95. B — Current can be measured without opening the conductor path: a current clamp senses the magnetic field around a conductor, allowing current measurement without disconnecting the circuit and inserting a meter in series. Coolant, alignment, and rotor measurements require dedicated methods and are not obtained from a magnetic current probe. Confirm the diagnosis with the appropriate test before replacing parts, then.

96. D — It identifies circuit paths, connectors, splices, grounds, and shared loads: a wiring diagram shows how the circuit is actually connected so testing can be divided at logical points and shared components recognized. It supports testing rather than replacing it and cannot guarantee a visible defect or alter protective-device ratings. Confirm the diagnosis with the appropriate test before replacing parts, then.

97. D — A misfire has been detected on cylinder 2, but the cause still requires diagnosis: the code identifies a detected cylinder-specific misfire condition, not the failed part; ignition, fuel, compression, wiring, and mechanical causes still require testing. Jumping directly to one component ignores the diagnostic meaning of the code and risks unnecessary replacement.

98. C — 3.7 hours: total labor time is the sum of diagnostic and repair time, so 1.3 hours plus 2.4 hours equals 3.7 hours. The other choices result from subtraction or incorrect decimal addition rather than combining both portions of the job. Following service information and verifying the final result reduces repeat repairs and protects surrounding components.

99. B — Recheck operation under the conditions that produced the complaint and rescan as appropriate: repair verification confirms that the original symptom is gone and that related systems operate normally under the conditions that once exposed the fault. Larger fuses and unverified code clearing can hide problems, while unnecessary battery disconnection can erase useful information.

100. A — About 67%: divide the applied torque by the specified torque: 60 divided by 90 equals about 0.667, or 67 percent. The other percentages come from subtracting values or reversing the ratio instead of comparing applied torque with the required specification. Following service information and verifying the final result reduces repeat repairs and protects surrounding components.