SECTION L1 — ADVANCED ENGINE PERFORMANCE SPECIALIST PRACTICE EXAMS

The seven full-length simulation exams in Section L1 cover the ASE L1 Advanced Engine Performance Specialist certification — the capstone certification of the ASE A-series. Each exam contains fifty multiple-choice questions delivered in the exact format the live L1 test uses, with the same domain weighting that ASE specifies for the current version of the test:

- **General Powertrain Diagnosis** — 17 questions per exam (34 percent)
- **Computerized Powertrain Controls Diagnosis (Including OBD-II)** — 14 questions per exam (28 percent)
- **Ignition System Diagnosis** — 5 questions per exam (10 percent)
- **Fuel Systems and Air Induction Systems Diagnosis** — 7 questions per exam (14 percent)
- **Emissions Control Systems Diagnosis (Including OBD-II)** — 4 questions per exam (8 percent)
- **I/M Failure Diagnosis** — 3 questions per exam (6 percent)

L1 stands apart from every other ASE certification because it is the **advanced diagnostic specialty test** — the certification that proves a technician can diagnose the most complex modern powertrain problems. L1 is fundamentally different from A8 in three critical ways. First, L1 is composite case study test format on the official exam — questions are built around realistic vehicle scenarios that include a Vehicle Information sheet (the vehicle data, complaint, recent repair history, and observed conditions) and a Composite Vehicle Type Reference data sheet (specifications, normal operating values, and component descriptions). The technician must read the scenario, interpret the data, and select the proper diagnostic conclusion. Second, L1 requires deeper diagnostic skills than any other A-series test — the candidate must synthesize information from multiple systems, interpret scan tool data including freeze frame and Mode 6 data, evaluate sensor waveforms, and identify the root cause of complex drivability and emissions failures. Third, L1 is the only ASE test that focuses heavily on **I/M (Inspection and Maintenance) failure diagnosis** — diagnosing why a vehicle failed an emissions test and identifying the specific cause of failure.

The defining characteristic of the L1 exam is that **general powertrain diagnosis** is the largest single domain at thirty-four percent. Seventeen questions per exam directly involve diagnostic reasoning across multiple systems — interpreting customer complaints, evaluating symptoms, analyzing scan tool data, identifying root causes, and applying systematic diagnostic methodology. The L1-certified technician must demonstrate advanced diagnostic thinking, not just component knowledge.

A second defining characteristic is that **computerized powertrain controls** at twenty-eight percent reflects the modern integration of electronics throughout the powertrain. Fourteen questions per exam directly involve PCM operation, sensor and actuator diagnosis, OBD-II diagnostic theory, scan tool data interpretation (live data, freeze frame, Mode 6, Mode 9), sensor waveform analysis, and the diagnosis of complex electronic powertrain faults. The L1 candidate must understand OBD-II at a deep level — monitor types, monitor enabling criteria, monitor completion, freeze frame conditions, and the systematic interpretation of OBD-II diagnostic data.

A third defining characteristic is that **fuel systems and air induction** at fourteen percent and **ignition system diagnosis** at ten percent test deeper diagnostic skill in these areas than A8. The L1-certified technician must diagnose subtle fuel system issues (fuel trim analysis, fuel pressure under varied conditions, injector balance evaluation, GDI-specific diagnostics), advanced air induction issues (MAF/MAP correlation, throttle body diagnostics, vacuum leak diagnosis with smoke testing, intake restriction analysis), and ignition system issues using oscilloscope analysis (primary and secondary patterns, firing line interpretation, intermediate section analysis, dwell evaluation).

A fourth defining characteristic is that **emissions control systems** at eight percent and **I/M failure diagnosis** at six percent are unique to L1. The L1 candidate must understand OBD-II monitor functions in depth (catalyst monitor, EVAP monitor, oxygen sensor monitor, EGR monitor, secondary air monitor), monitor readiness and drive cycle requirements, and the specific diagnostic procedures for I/M test failures. When a vehicle fails an emissions test, the L1 technician must identify why — was it a component fault, monitor incompletion, OBD-II fault, or other cause. This skill is rare among working technicians and is the differentiator that separates L1-certified technicians from the rest of the field.

A fifth defining characteristic is that **L1 is the gateway to ASE Master Technician status**. To achieve ASE Master Technician (Automobile) status, a technician must pass A1 through A8 plus L1. The technician who lacks L1 is not a Master. The L1 certification carries significant prestige and economic value because it is the diagnostic capstone — the proof that the technician can solve problems that other technicians cannot.

A sixth defining characteristic is that **case study format** characterizes the live L1 test. The official L1 exam typically presents a Vehicle Information sheet describing the vehicle and concern, a Composite Vehicle Type Reference data sheet describing specifications and normal operating values, and questions that require interpreting both data sources to arrive at the correct diagnosis. The technician must read carefully, interpret the data accurately, and apply systematic diagnostic methodology to the specific scenario.

The exams in this section progress from foundational L1 diagnostic methodology in early exams to integrated multi-domain scenarios in later exams. Early exams focus on individual diagnostic techniques and component-level analysis. Middle exams introduce comparative diagnosis and the integration of multiple systems. Later exams concentrate on complex case scenarios where the technician must synthesize information across all powertrain domains to identify the root cause of advanced drivability and emissions issues.

Total practice questions in Section L1: **350 questions** across 7 simulation exams.

Set a timer for ninety minutes when taking each exam, work through the questions without referencing notes, and resist the temptation to peek at the answer key until you have submitted your final answer for every question. Treat each simulation as if it were the live L1 test waiting for you at a Prometric testing center. Pay particular attention to general powertrain diagnosis questions, OBD-II monitor analysis, and I/M failure diagnosis content — these are the areas where strong L1 candidates separate themselves from those who lack advanced diagnostic skills or who struggle with the systematic interpretation of complex modern powertrain data. The L1 exam is the most challenging in the ASE A-series; with consistent practice and careful study of the seven simulations in this section, you will be prepared to earn the certification that proves your advanced diagnostic ability and unlocks ASE Master Technician status.

PRACTICE EXAM 1: L1 SIMULATION — ADVANCED ENGINE PERFORMANCE SPECIALIST

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1. A vehicle has been brought in with a complaint of intermittent stalling. The MOST appropriate first diagnostic step is to:

A. Verify the concern, retrieve DTCs and freeze frame data, identify the approach

B. Replace the PCM as a precaution

C. Replace the spark plugs as the most direct repair

D. Apply compressed air to the system

2. The proper procedure for analyzing freeze frame data on the L1 case study format is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Visually inspect for visible damage only

D. Read the operating conditions captured at the moment the DTC was set

3. A vehicle's freeze frame data shows engine speed 2,000 RPM, MAP 45 kPa, fuel trim +25%, ECT 195°F. The MOST likely cause is:

A. A worn power steering pulley

B. Excessive lean correction at cruising operation

C. A worn ball joint

D. Air in the clutch hydraulic system

4. The proper procedure for diagnosing high positive long-term fuel trim is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the PCM as a precaution

D. Verify the concern, identify lean condition cause (vacuum leak, fuel issue, sensor)

5. A vehicle's scan tool shows long-term fuel trim of +25% on bank 1 and +5% on bank 2. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the PCM as a precaution

C. A bank-specific lean condition (vacuum leak, injector, fuel distribution)

D. Replace the brake fluid as the only step

6. The proper procedure for diagnosing bank-specific fuel trim issues is to:

A. Apply compressed air to the system

B. Verify the concern, isolate the affected bank, identify the cause

C. Replace the PCM as a precaution

D. Visually inspect for visible damage only

7. A vehicle has been brought in with the following findings: misfire complaint, P0300 set, freeze frame at 1,500 RPM/30 kPa, secondary patterns show uneven firing voltages. The MOST likely cause is:

A. Multiple ignition issues affecting different cylinders simultaneously

B. Apply compressed air to the system

C. Replace the engine as a precaution

D. Replace the brake fluid as the only step

8. The proper procedure for analyzing OBD-II monitor readiness is to:

A. Apply compressed air to the system

B. Replace the PCM as a precaution

C. Replace the affected components as a precaution

D. Use scan tool to view monitor status, complete drive cycle as needed

9. A vehicle's monitor readiness shows catalyst monitor not ready after extended driving. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Monitor enabling criteria not met, or fault preventing completion

D. Replace the brake fluid as the only step

10. The proper procedure for completing the catalyst monitor is to:

A. Apply compressed air to the system

B. Follow the manufacturer-specified drive cycle, verify enabling criteria

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

11. A vehicle has been brought in with a failed I/M test for monitor incomplete. The MOST appropriate action is:

A. Verify monitor status, identify incomplete monitors, complete drive cycle

B. Apply compressed air to the system

C. Replace the PCM as a precaution

D. Replace the brake fluid as the only step

12. The proper procedure for verifying an I/M test failure cause is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the PCM as a precaution

D. Identify the failure reason, retrieve data, identify the root cause

13. A vehicle has been brought in with: failed I/M test for high HC, no DTCs, normal fuel trims, oxygen sensors switching properly. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Catalyst efficiency below spec despite normal upstream feedback

D. Replace the brake fluid as the only step

14. The proper procedure for diagnosing I/M test catalyst failure is to:

A. Apply compressed air to the system

B. Verify the failure, evaluate catalyst efficiency, identify the cause

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

15. A vehicle has been brought in with: failed I/M test for high NOx, normal fuel trims, EGR DTCs set, low EGR flow. The MOST likely cause is:

A. EGR system fault preventing combustion temperature reduction

B. Apply compressed air to the system

C. Replace the EGR system as a precaution

D. Replace the brake fluid as the only step

16. The proper procedure for diagnosing I/M test NOx failure is to:

A. Apply compressed air to the system

B. Replace the EGR system as a precaution

C. Replace the affected components as a precaution

D. Verify the failure, identify NOx control fault, address the cause

17. A vehicle has been brought in with: complaint of poor fuel economy, normal fuel trims, normal sensor data, no DTCs. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the fuel system as a precaution

C. Mechanical issue (compression, valves, driveline) not detected by OBD-II

D. Replace the brake fluid as the only step

18. The proper procedure for diagnosing fuel economy issues without DTCs is to:

A. Apply compressed air to the system

B. Verify the concern, perform mechanical testing (compression, leak-down, backpressure)

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

19. A vehicle has been brought in with: complaint of misfire after deceleration, misfire counts on cylinders 2 and 3, freeze frame at 1,000 RPM/35 kPa, normal patterns. The MOST likely cause is:

A. Fuel delivery issue affecting specific cylinders during deceleration

B. Apply compressed air to the system

C. Replace the engine as a precaution

D. Replace the brake fluid as the only step

20. The proper procedure for diagnosing condition-specific misfire is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the spark plugs as a precaution

D. Verify the concern, monitor scan data during the specific condition

21. A vehicle has been brought in with: P0420 set, secondary patterns normal, downstream sensor following upstream switching. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Catalyst lost storage capacity, allowing downstream to follow upstream

D. Replace the brake fluid as the only step

22. The proper procedure for diagnosing P0420 with proper sensor data is to:

A. Apply compressed air to the system

B. Verify the concern, evaluate efficiency, identify the cause (catalyst, sensor)

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

23. A vehicle has been brought in with: complaint of hesitation on acceleration, MAF 12 g/s at idle, MAP 30 kPa, expected MAF 4 g/s at idle. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the PCM as a precaution

C. Replace the MAF as a precaution

D. MAF reading higher than expected, indicating sensor calibration or sensor drift issue

24. The proper procedure for diagnosing MAF accuracy issues is to:

A. Compare MAF reading at idle to spec, evaluate at varied conditions, identify accuracy issue

B. Apply compressed air to the sensor

C. Replace the MAF as a precaution

D. Replace the brake fluid as the only step

25. A vehicle has been brought in with: complaint of stall on deceleration, idle air control system DTCs, scan data shows IAC commanded high but actual idle low. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the IAC as a precaution

C. IAC system fault preventing proper idle air flow control

D. Replace the brake fluid as the only step

26. The proper procedure for diagnosing IAC issues is to:

A. Apply compressed air to the system

B. Verify the concern, monitor IAC commands and actual idle, identify the cause

C. Replace the IAC as a precaution

D. Visually inspect for visible damage only

27. A vehicle has been brought in with: complaint of hard hot start, normal cold start, fuel pressure normal at idle, fuel pressure drops with key off but takes 5 minutes to bleed. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the fuel pump as a precaution

C. Replace the regulator as a precaution

D. Fuel system check valve issue allowing pressure bleed-down

28. The proper procedure for diagnosing hot start issues is to:

A. Verify the concern, monitor fuel pressure during hot soak, identify the cause

B. Apply compressed air to the system

C. Replace the fuel system as a precaution

D. Replace the brake fluid as the only step

29. A vehicle has been brought in with: complaint of MIL on, P0171 and P0174 set, no visible vacuum leaks, fuel pressure normal at idle but drops below spec at WOT. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the fuel pump as a precaution

C. Insufficient fuel volume under high demand (weak pump, restricted filter)

D. Replace the brake fluid as the only step

30. The proper procedure for diagnosing P0171 and P0174 with proper idle conditions is to:

A. Apply compressed air to the system

B. Verify the concern, test fuel volume under load, identify the cause

C. Replace the fuel pump as a precaution

D. Replace the brake fluid as the only step

31. A vehicle has been brought in with: complaint of MIL on, P0300 misfire, no specific cylinders identified, freeze frame shows MAP at 70 kPa under load, secondary patterns show high firing voltages on multiple cylinders. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the engine as a precaution

C. Replace the spark plugs as a precaution

D. Multi-cylinder ignition issue affecting all cylinders under load

32. The proper procedure for diagnosing multi-cylinder load-related misfire is to:

A. Verify the concern, monitor scan data and patterns under load, identify the common cause

B. Apply compressed air to the system

C. Replace the engine as a precaution

D. Replace the brake fluid as the only step

33. A vehicle has been brought in with: complaint of stall at idle only, normal scan data, normal patterns, vacuum leak suspected but smoke test negative. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Internal leak (PCV, EGR, throttle body) not detected by external smoke test

D. Replace the brake fluid as the only step

34. The proper procedure for diagnosing internal vacuum leaks is to:

A. Apply compressed air to the system

B. Verify the concern, inspect internal components (PCV, EGR, throttle), identify the cause

C. Replace the affected components as a precaution

D. Visually inspect for visible damage only

35. A vehicle has been brought in with: complaint of MIL on, P0171 set bank 1 only, fuel trims normal at idle but lean at cruise, fuel pressure normal. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the PCM as a precaution

D. Bank-specific air leak that becomes significant only at specific load conditions

36. The proper procedure for diagnosing condition-specific bank-specific lean is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Verify the concern, monitor fuel trims at varied conditions, identify the cause

D. Replace the brake fluid as the only step

37. A vehicle has been brought in with: complaint of poor performance under load, P0335 (CKP circuit) set intermittently, scan data shows occasional CKP signal loss under load. The MOST likely cause is:

A. Marginal CKP sensor or wiring issue manifesting under load

B. Apply compressed air to the system

C. Replace the PCM as a precaution

D. Replace the brake fluid as the only step

38. The proper procedure for diagnosing intermittent CKP issues is to:

A. Apply compressed air to the sensor

B. Verify the concern under load conditions, monitor CKP signal, perform wiggle testing

C. Replace the sensor as a precaution

D. Replace the brake fluid as the only step

39. A vehicle has been brought in with: complaint of failed catalyst monitor, no DTCs, monitor not completing, drive cycle attempted multiple times. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Replace the PCM as a precaution

D. Monitor enabling criteria not being met during driving (specific RPM, load, or coolant temp)

40. The proper procedure for completing a stuck catalyst monitor is to:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Verify enabling criteria, follow manufacturer drive cycle, identify the blocking factor

D. Replace the brake fluid as the only step

41. A vehicle has been brought in with: complaint of MIL on, P0455 (gross EVAP leak), smoke test reveals no leak, fuel cap properly tightened. The MOST likely cause is:

A. Internal EVAP component fault not detected by external smoke test

B. Apply compressed air to the system

C. Replace the EVAP system as a precaution

D. Replace the brake fluid as the only step

42. The proper procedure for diagnosing P0455 with negative smoke test is to:

A. Apply compressed air to the system

B. Verify the concern, test individual EVAP components, identify the internal fault

C. Replace the EVAP system as a precaution

D. Replace the brake fluid as the only step

43. A vehicle has been brought in with: complaint of MIL on, P0440 (EVAP malfunction), normal smoke test, EVAP system functional during testing. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the EVAP system as a precaution

C. Replace the PCM as a precaution

D. Intermittent EVAP fault, sensor issue, or DTC set under specific conditions

44. The proper procedure for diagnosing intermittent EVAP DTCs is to:

A. Apply compressed air to the system

B. Replace the EVAP system as a precaution

C. Verify the concern, test under matching conditions, identify the cause

D. Replace the brake fluid as the only step

45. A vehicle has been brought in with: customer complaint of hesitation, no DTCs, normal scan data, normal patterns, hesitation only after extended highway driving. The MOST likely cause is:

A. Apply compressed air to the system

B. Heat-related component sensitivity (sensor drift, marginal connection at temperature)

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

46. The proper procedure for diagnosing heat-related drivability issues is to:

A. Verify the concern under matching heat conditions, monitor scan data, identify the cause

B. Apply compressed air to the system

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

47. A vehicle has been brought in with: complaint of poor fuel economy, all monitors complete and ready, no DTCs, all scan data within spec. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the PCM as a precaution

D. Mechanical issue, driving habits, or factor outside OBD-II monitoring scope

48. The proper procedure for diagnosing fuel economy issues with proper OBD-II data is to:

A. Apply compressed air to the system

B. Verify the concern, perform mechanical testing, evaluate factors outside OBD-II scope

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

49. A vehicle has been brought in with: complaint of MIL on, multiple DTCs across multiple modules, network communication faults, all symptoms appeared simultaneously. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the affected modules as a precaution

C. Common cause affecting multiple modules (network, power, ground, or shared sensor)

D. Replace the brake fluid as the only step

50. The proper procedure for diagnosing multi-module DTCs with simultaneous onset is to:

A. Verify the concern, identify common causes, address findings systematically

B. Apply compressed air to the system

C. Replace the affected modules as a precaution

D. Replace the brake fluid as the only step

PRACTICE EXAM 1: L1 SIMULATION — ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

1. A — Verify the concern, retrieve DTCs and freeze frame data, identify the approach. L1 diagnosis begins with concern verification and comprehensive data retrieval. Freeze frame data captures the conditions when the DTC was set, providing critical diagnostic information. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

2. D — Read the operating conditions captured at the moment the DTC was set. Freeze frame data is the L1 candidate's primary tool for understanding when faults occur. The conditions enable systematic reproduction and diagnosis. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

3. B — Excessive lean correction at cruising operation. Fuel trim of +25% indicates the PCM is adding 25% more fuel than calculated to maintain proper mixture. The condition was captured at cruising RPM and partial throttle. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

4. D — Verify the concern, identify lean condition cause (vacuum leak, fuel issue, sensor). High positive fuel trim diagnosis requires systematic identification of the lean condition source. Each potential cause produces this trim signature. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

5. C — A bank-specific lean condition (vacuum leak, injector, fuel distribution). Disparate fuel trims between banks indicates bank-specific issue. The trim that is high indicates which bank is lean. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

6. B — Verify the concern, isolate the affected bank, identify the cause. Bank-specific fuel trim diagnosis requires isolation methodology. The affected bank reveals where to focus diagnostic effort. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

7. A — Multiple ignition issues affecting different cylinders simultaneously. Uneven secondary firing voltages with P0300 indicates multiple ignition issues. Each affected cylinder produces a different firing voltage. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

8. D — Use scan tool to view monitor status, complete drive cycle as needed. Monitor readiness analysis requires scan tool integration. Incomplete monitors prevent emissions test passage. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

9. C — Monitor enabling criteria not met, or fault preventing completion. Catalyst monitor not ready after extended driving indicates enabling criteria issue. Each monitor has specific conditions required for testing. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

10. B — Follow the manufacturer-specified drive cycle, verify enabling criteria. Catalyst monitor completion requires manufacturer drive cycle. The criteria must be met for the monitor to run. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

11. A — Verify monitor status, identify incomplete monitors, complete drive cycle. I/M test failure for monitor incomplete is the most common L1 scenario. Drive cycle completion enables proper test passage. *ASE Task Reference: L1 Domain F — I/M Failure Diagnosis. Review subsection L.6.*

12. D — Identify the failure reason, retrieve data, identify the root cause. I/M failure diagnosis requires identification of the specific cause. Each failure type has different diagnostic procedures. *ASE Task Reference: L1 Domain F — I/M Failure Diagnosis. Review subsection L.6.*

13. C — Catalyst efficiency below spec despite normal upstream feedback. High HC with normal upstream sensor activity indicates catalyst efficiency issue. The catalyst is not converting HC properly despite proper input feedback. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

14. B — Verify the failure, evaluate catalyst efficiency, identify the cause. I/M test catalyst failure diagnosis requires efficiency evaluation. The methodology determines whether the catalyst or sensors are at fault. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

15. A — EGR system fault preventing combustion temperature reduction. High NOx with EGR DTCs and low flow indicates EGR system fault. EGR is the primary NOx control mechanism in modern engines. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

16. D — Verify the failure, identify NOx control fault, address the cause. I/M test NOx failure diagnosis requires identification of the NOx control issue. EGR is the primary system for NOx reduction. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

17. C — Mechanical issue (compression, valves, driveline) not detected by OBD-II. Poor fuel economy with normal OBD-II data indicates issues outside OBD-II scope. Mechanical

inefficiencies are not always detected by OBD-II. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

18. B — Verify the concern, perform mechanical testing (compression, leak-down, backpressure). Fuel economy diagnosis without DTCs requires mechanical investigation. Each test reveals different aspects of engine mechanical condition. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

19. A — Fuel delivery issue affecting specific cylinders during deceleration. Cylinder-specific misfire on deceleration indicates condition-specific fuel issue. The deceleration mode triggers the symptom. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

20. D — Verify the concern, monitor scan data during the specific condition. Condition-specific misfire diagnosis requires symptom-matching observation. The fault must be observed when it occurs. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

21. C — Catalyst lost storage capacity, allowing downstream to follow upstream. P0420 with downstream sensor following upstream indicates catalyst aging. Healthy catalysts produce stable downstream readings. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

22. B — Verify the concern, evaluate efficiency, identify the cause (catalyst, sensor). P0420 diagnosis requires distinguishing catalyst fault from sensor fault. The sensor activity reveals which is at fault. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

23. D — MAF reading higher than expected, indicating sensor calibration or sensor drift issue. MAF reading 12 g/s at idle when expected 4 g/s indicates 3x normal reading. The high reading produces excessive fuel command. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

24. A — Compare MAF reading at idle to spec, evaluate at varied conditions, identify accuracy issue. MAF accuracy diagnosis requires comparison to specifications. Both idle and load conditions reveal sensor accuracy. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

25. C — IAC system fault preventing proper idle air flow control. Stall on deceleration with IAC commanded high but actual idle low indicates IAC system fault. The system cannot maintain commanded idle. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

26. B — Verify the concern, monitor IAC commands and actual idle, identify the cause. IAC diagnosis requires comparison of commands to actual operation. The discrepancy reveals the fault. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

27. D — Fuel system check valve issue allowing pressure bleed-down. Hot start issue with normal cold start and slow pressure bleed indicates check valve fault. The valve cannot maintain pressure during hot soak. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

28. A — Verify the concern, monitor fuel pressure during hot soak, identify the cause. Hot start diagnosis requires pressure monitoring during the specific condition. The pressure behavior reveals the cause. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

29. C — Insufficient fuel volume under high demand (weak pump, restricted filter). P0171 and P0174 with normal idle pressure but low pressure at WOT indicates volume issue. The pump cannot deliver demanded volume. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

30. B — Verify the concern, test fuel volume under load, identify the cause. Fuel volume testing under load reveals high-demand insufficiency. Static pressure testing alone cannot detect this issue. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

31. D — Multi-cylinder ignition issue affecting all cylinders under load. P0300 with high firing voltages on multiple cylinders under load indicates multi-cylinder ignition issue. The load condition triggers the symptom. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

32. A — Verify the concern, monitor scan data and patterns under load, identify the common cause. Multi-cylinder load-related misfire diagnosis requires monitoring under load. The common cause must be identified. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

33. C — Internal leak (PCV, EGR, throttle body) not detected by external smoke test. Stall at idle with negative smoke test indicates internal leak. External smoke testing cannot detect leaks within sealed components. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

34. B — Verify the concern, inspect internal components (PCV, EGR, throttle), identify the cause. Internal leak diagnosis requires component-specific testing. Each component can produce internal leaks. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

35. D — Bank-specific air leak that becomes significant only at specific load conditions. Lean trim at cruise but not idle indicates load-specific leak. The leak's effect depends on operating conditions. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

36. C — Verify the concern, monitor fuel trims at varied conditions, identify the cause. Condition-specific bank-specific lean diagnosis requires monitoring at varied conditions. The variation reveals when the leak is significant. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

37. A — Marginal CKP sensor or wiring issue manifesting under load. Intermittent P0335 under load indicates marginal sensor or wiring. The load condition triggers the marginal failure. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

38. B — Verify the concern under load conditions, monitor CKP signal, perform wiggle testing. Intermittent CKP diagnosis requires symptom-matching conditions and physical testing. Each method reveals different aspects. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

39. D — Monitor enabling criteria not being met during driving (specific RPM, load, or coolant temp). Failed catalyst monitor without DTCs indicates criteria not being met. Each monitor has specific enabling criteria. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

40. C — Verify enabling criteria, follow manufacturer drive cycle, identify the blocking factor. Stuck monitor diagnosis requires criteria verification. The blocking factor prevents completion. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

41. A — Internal EVAP component fault not detected by external smoke test. P0455 with negative smoke test indicates internal fault. External testing cannot detect internal valve or sensor faults. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

42. B — Verify the concern, test individual EVAP components, identify the internal fault. Internal EVAP diagnosis requires component-specific testing. Each component can produce internal faults. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

43. D — Intermittent EVAP fault, sensor issue, or DTC set under specific conditions. P0440 with normal current testing indicates intermittent issue. The fault occurred at a different operating condition. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

44. C — Verify the concern, test under matching conditions, identify the cause. Intermittent EVAP DTC diagnosis requires symptom-matching conditions. The fault must be observed when it occurs.

ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.

45. B — Heat-related component sensitivity (sensor drift, marginal connection at temperature). Hesitation only after extended highway driving indicates heat-related issue. Components affected by temperature produce condition-specific symptoms. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

46. A — Verify the concern under matching heat conditions, monitor scan data, identify the cause. Heat-related drivability diagnosis requires symptom-matching conditions. The fault must be observed under heat. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

47. D — Mechanical issue, driving habits, or factor outside OBD-II monitoring scope. Poor fuel economy with proper OBD-II data indicates issue outside OBD-II scope. OBD-II cannot detect all efficiency issues. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

48. B — Verify the concern, perform mechanical testing, evaluate factors outside OBD-II scope. Fuel economy diagnosis without OBD-II indication requires alternative methods. Mechanical and operational factors must be evaluated. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

49. C — Common cause affecting multiple modules (network, power, ground, or shared sensor). Simultaneous multi-module DTCs indicate common cause. Single component faults can affect multiple modules. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

50. A — Verify the concern, identify common causes, address findings systematically. Multi-module DTC diagnosis requires systematic approach. Common causes often produce multiple symptoms. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*