

Automotive Electrical and Engine Performance 9th Edition
Chapter 9 – On-Board Diagnosis
Quiz A

1. What is the primary purpose of OBD-II diagnostic trouble codes (DTCs)?
 - a. Monitoring air-fuel mixture during ignition cycles
 - b. Ensuring proper catalytic converter functionality
 - c. Identifying emission-related faults and enabling repairs
 - d. Preventing engine misfire during driving

2. What is the difference between a Type A and Type B OBD-II DTC?
 - a. Type A codes store information for emissions compliance tests, while Type B codes are unrelated to emissions.
 - b. Type A codes illuminate the MIL on the first fault trip, while Type B codes require two consecutive fault trips.
 - c. Type A codes are manufacturer-specific, while Type B codes are generic SAE codes.
 - d. Type A codes monitor catalytic converters exclusively, while Type B codes handle all other engine components.

3. Which component does the comprehensive component monitor (CCM) typically check?
 - a. High voltage circuits in EV systems
 - b. Sensors and actuators for open circuits and rationality
 - c. Engine compression under load conditions
 - d. Evaporative system integrity during vehicle startup

4. What happens when the PCM detects an engine misfire that could damage the catalytic converter?
 - a. The MIL flashes, and a DTC is stored for misfire type A.
 - b. The MIL turns on steady, indicating a fuel system fault.
 - c. The PCM shuts off the ignition system to prevent further damage.
 - d. A freeze-frame is recorded with coolant and RPM data.

5. How does the exponentially weighted moving average (EWMA) monitor ensure system reliability?
- By measuring battery voltage changes over multiple trips
 - By smoothing performance data through averaging multiple test cycles
 - By verifying rationality between multiple oxygen sensors
 - By testing a system multiple times under cold-start conditions
6. What is the primary function of the fuel trim monitor in OBD-II systems?
- To ensure proper operation of the ignition system
 - To monitor oxygen sensor output under dynamic loads
 - To track short-term and long-term fuel adjustments for maintaining emissions compliance
 - To monitor fuel pressure stability across multiple injectors
7. What is a common cause of an evaporative emissions monitor failure?
- Faulty upstream oxygen sensor
 - Loose gas cap or deteriorated vapor lines
 - Malfunctioning idle air control valve
 - Insufficient engine coolant temperature
8. When does the oxygen sensor heater monitor typically activate?
- During a cold start when engine temperature is below 86°F
 - After detecting a misfire on multiple trips
 - When the vehicle reaches operating temperature
 - After the catalytic converter monitor completes its cycle
9. How many warm-up cycles are required for a DTC to automatically clear after repairs are completed?
- 20
 - 40
 - 80
 - 10

10. Which diagnostic trouble code (DTC) represents a catalyst efficiency failure in Bank 1?

a. P0300

b. P0420

c. P0171

d. P0456

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Correct Answers:

1. c

2. b

3. b

4. a

5. c

6. d

7. b

8. a

9. b

10. c