Automotive Electrical and Engine Performance 8th Edition
Chapter 9 – On-Board Diagnosis
Quiz B

1. What are the four primary requirements of OBD-II regulations?

a. Engine performance, driver safety, fault monitoring, and calibration

b. Emission control, fault detection, MIL activation, and system testing

c. Sensor optimization, DTC recording, exhaust monitoring, and energy efficiency

d. Exhaust reduction, ignition timing, diagnostic resets, and battery checks

2. What is the role of the comprehensive component monitor (CCM) in OBD-II systems?

a. Continuously checks the operation of emission-related components and circuits

b. Manages the timing and priority of diagnostic tests and monitors

c. Identifies rationality errors in onboard control systems

d. Validates catalyst efficiency using exponential moving averages

3. Which conditions globally disable certain OBD-II monitors during operation?

a. High fuel consumption rates and advanced timing

b. Low battery voltage, high altitude, or low ambient temperature

c. Closed-loop operation and continuous sensor switching

d. Rapid ignition timing and fuel ratio imbalance

4. What is the function of freeze-frame data in OBD-II diagnostics?

a. Prevents the MIL from flashing when a fault is detected

b. Automatically clears pending DTCs when operating conditions are stable

c. Captures and stores critical engine data at the time of a fault detection

d. Measures oxygen sensor efficiency across trip conditions

5. What criteria must be met for the catalyst monitor to run in an OBD-II system?

a. Closed-loop fuel control, proper temperature, and engine under load

b. Open-loop fuel system, vehicle idling, and short-term fuel trim adjustment

c. Exhaust temperature exceeding threshold limits with system reset

d. High-speed operation and continuous ignition adjustment

6. Which DTC category indicates a fault in communication between system modules?

a. Bxxx

b. Cxxx

c. Uxxx

d. Pxxx

7. What operational phase is required for the oxygen sensor monitor to initiate testing?

a. Vehicle cruising at a constant high speed

b. Engine operating in closed-loop mode and achieving sufficient temperature

c. Diagnostic executive prioritizing secondary monitors

d. Sequential ignition and misfire detection

8. Which component or condition is NOT included in the fuel trim monitor?

a. Short-term fuel correction percentages

b. Mass airflow sensor calibration

c. Adaptive long-term memory values

d. Throttle position during rapid acceleration

9. What distinguishes a Type A diagnostic trouble code (DTC)?

a. Immediate MIL activation upon detection

b. MIL activation after two consecutive faults

c. No effect on the MIL or emissions test readiness

d. Specific to engine misfire diagnostics

10. What is the purpose of the exponentially weighted moving average (EWMA) in OBD-II monitors?

a. Detecting rapid misfire conditions during test cycles

b. Smoothing test results over multiple drive cycles for reliability

c. Calibrating throttle response for EGR system adjustments

d. Analyzing fuel pressure variances in real-time conditions

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Correct Answers:

1. b
2. a
3. d
4. c
5. a
6. c
7. b
8. d
9. a
10. b