

Automotive Electrical and Engine Performance 9th Edition
Chapter 10 – Global OBD-II and Mode \$06
Quiz A

1. What does Mode \$06 in OBD-II diagnostics primarily monitor?
 - a. Current powertrain parameters (PIDs)
 - b. Freeze-frame data
 - c. Non-continuously monitored systems
 - d. Comprehensive component monitors

2. What is the hexadecimal code system used in OBD-II diagnostics?
 - a. A system that converts voltage readings into percentages
 - b. A numerical format that includes 0–9 and letters A–F
 - c. A tool to measure engine operating temperature
 - d. A conversion chart for torque specifications

3. What is the first step in diagnosing problems using Mode \$06 data?
 - a. Replacing the component that triggered the fault
 - b. Checking the monitor status before starting repairs
 - c. Accessing freeze-frame data for historical faults
 - d. Clearing all diagnostic trouble codes (DTCs)

4. Why is Mode \$06 particularly useful for technicians?
 - a. It allows them to identify components close to failure without triggering a DTC
 - b. It bypasses the need for OEM-specific diagnostic tools
 - c. It provides real-time oxygen sensor voltage readings
 - d. It identifies short-term fuel trim variations

5. What does a "Pass" result in Mode \$06 indicate?
- The test completed successfully, but may have been close to failing
 - The diagnostic tool encountered an incomplete test
 - The fault lies outside of the monitored system
 - The system requires additional testing
6. How are Mode \$06 data values converted into usable information?
- Using standard conversion factors provided by the vehicle manufacturer
 - Through hexadecimal-to-decimal conversion
 - By multiplying raw numbers by specified factors, such as 0.000015 for misfire percentages
 - Using scan tools with automatic data translation features
7. Why might Mode \$06 be more effective than an oscilloscope for certain tests?
- It provides simplified visual outputs for voltage transitions
 - It allows technicians to monitor time-sensitive reactions, like oxygen sensor switch times, more efficiently
 - It calculates fuel trim ratios automatically
 - It eliminates the need for waveform analysis
8. What is a practical application of Mode \$06 data in emission system diagnostics?
- Checking the efficiency of catalytic converters using predefined limits
 - Verifying fuel injector timing
 - Monitoring EGR valve operation through duty cycle percentages
 - Adjusting engine idle speed for better performance
9. How can a technician determine if a misfire fault is severe enough to damage the catalytic converter?
- By calculating the misfire percentage from Mode \$06 data using the appropriate factor
 - By analyzing the freeze-frame data for RPM and coolant temperature
 - By identifying pending trouble codes stored in the PCM
 - By observing oxygen sensor voltage changes during acceleration

10. What type of information does Mode \$06 provide for oxygen sensor diagnostics?

- a. Voltage amplitude and reaction time
- b. Resistance changes and heating element status
- c. Rich-to-lean and lean-to-rich transition times
- d. Sensor operational efficiency and maximum limit comparisons

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Correct Answers:

1. c

2. b

3. b

4. a

5. a

6. c

7. b

8. c

9. a

10. d