Automotive Electrical and Engine Performance 9th Edition
Chapter 33 – Narrow and Wide-Band Oxygen Sensors
Multiple Choice Questions Quiz A

1. What does a high voltage output (close to 1V) from a zirconia oxygen sensor indicate about the exhaust stream?

a) It is rich in oxygen content.

b) It is lean in oxygen content.

c) It indicates no oxygen in the exhaust.

d) It is rich in fuel content.

2. Which component in an oxygen sensor acts as the reference for ambient air?

a) Platinum electrode

b) Ambient side electrode

c) Pump cell

d) Zirconia electrolyte

3. What is the typical role of a post-catalytic converter oxygen sensor in an OBD-II system?

a) To adjust the fuel trim for efficiency

b) To measure air-fuel ratios

c) To monitor catalytic converter efficiency

d) To adjust idle speed

4. How does a wide-band oxygen sensor differ from a narrow-band oxygen sensor?

a) It detects a wider range of air–fuel ratios.

b) It operates without needing a heater.

c) It does not require an ambient air reference.

d) It can detect only lean mixtures.

5. When an exhaust leak occurs upstream of an oxygen sensor, what type of indication does this often cause?

a) False rich indication

b) False lean indication

c) Excessive high voltage

d) Excessive low voltage

6. The PCM uses input from which sensor to switch from open-loop to closed-loop operation?

a) Intake Air Temperature (IAT) sensor

b) Manifold Absolute Pressure (MAP) sensor

c) Engine Coolant Temperature (ECT) sensor

d) Oxygen sensor (O2S)

7. A planar design is commonly used in which type of oxygen sensor?

a) Conventional narrow-band sensor

b) Heated three-wire sensor

c) Wide-band oxygen sensor

d) All of the above

8. What is the purpose of the heater circuit in a zirconia oxygen sensor?

a) To increase sensor response time by maintaining optimal temperature

b) To provide power to the PCM

c) To cool down the sensor to prevent overheating

d) To generate a voltage signal based on oxygen content

9. Which of the following is NOT a potential cause of a false rich condition in an oxygen sensor reading?

a) A faulty oxygen sensor ground connection

b) Silicon contamination from RTV sealant

c) A vacuum leak downstream of the sensor

d) Fuel-contaminated exhaust gases

10. In dual-cell wide-band oxygen sensors, the diffusion chamber is:

a) The ambient air reference for the sensor

b) The area exposed to exhaust gases

c) Shared by both reference and exhaust gases

d) Used to calibrate the fuel trim readings

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Answer Key Quiz A

Correct Answers:

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