Automotive Electrical and Engine Performance 9th Edition
Chapter 27 – Emission Control Devices Operation and Diagnosis
Quiz A

1. What is the primary function of a catalytic converter in a vehicle? a. Reduce harmful emissions through chemical reactions

b. Increase engine efficiency by altering fuel-air mixtures

c. Convert mechanical energy into electrical energy

d. Enhance exhaust sound quality through resonance

2. Which sensor is used in OBD-II systems to monitor catalytic converter efficiency?

a. Crankshaft position sensor

b. MAP sensor

c. Heated oxygen sensor (HO2S)

d. Exhaust gas temperature sensor

3. What is the effect of the EGR valve being stuck open?

a. Increased fuel efficiency

b. Smooth idle

c. Improved acceleration

d. Rough idle or stalling

4. What is the main purpose of the Positive Crankcase Ventilation (PCV) system?

a. Prevent oil leakage from the engine

b. Enhance engine cooling efficiency

c. Reduce HC and CO emissions by recirculating crankcase vapors

d. Maintain consistent engine vacuum levels

5. During which condition is the EGR system typically inactive?

a. High engine load

b. Wide-open throttle (WOT)

c. Moderate cruising speed

d. During normal idle operation

6. What is the primary cause of premature catalytic converter failure due to excessive heat?

a. Intake manifold leaks

b. Carbon deposits in the exhaust manifold

c. Defective vacuum-controlled solenoids

d. Unburned fuel entering the converter

7. What is the function of the cerium in modern catalytic converters?

a. Improve fuel economy by altering combustion timing

b. Store oxygen to assist in oxidation during lean exhaust conditions

c. Prevent mechanical wear of the substrate

d. Enhance the structural integrity of the catalytic material

8. Why are EGR systems designed to lower combustion temperatures?

a. To reduce CO and HC emissions

b. To enhance fuel vaporization

c. To limit the production of NOx emissions

d. To prevent thermal cracking of the intake manifold

9. What should the vacuum drop be when activating the EGR valve during engine diagnostics?

a. 2-4 inch Hg

b. 4-6 inch Hg

c. 6-8 inch Hg

d. 8-10 inch Hg

10. Which condition can lead to catalytic converter efficiency codes (e.g., P0420)?

a. Blocked fuel injectors

b. Faulty ignition coil

c. Oxygen sensor miscalibration

d. Contaminants like engine oil or antifreeze in the exhaust

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Correct Answers:

1. a

2. c

3. d

4. c

5. b

6. d

7. b

8. c

9. c

10. d