

Automotive Electrical and Engine Performance 8th Edition
Chapter 26 – Vehicle Emission Standards and Testing
Quiz A

1. What is the stoichiometric ratio of air to fuel for gasoline in internal combustion engines?
 - a. 12:1
 - b. 13.5:1
 - c. 16:1
 - d. 14.7:1

2. Which exhaust gas is primarily formed due to high combustion chamber temperatures exceeding 2,500°F?
 - a. Carbon monoxide (CO)
 - b. Hydrocarbons (HC)
 - c. Oxides of nitrogen (NOx)
 - d. Carbon dioxide (CO₂)

3. What is the role of a catalytic converter in vehicle exhaust systems?
 - a. Increase NOx emissions
 - b. Reduce CO and HC emissions by oxidation
 - c. Directly capture carbon dioxide
 - d. Enhance air–fuel ratio control

4. Which of the following is considered the "rich indicator" in exhaust analysis?
 - a. CO
 - b. O₂
 - c. HC
 - d. NOx

5. Which emissions standard level indicates a vehicle is entirely free of tailpipe emissions?
- a. LEV
 - b. ZEV
 - c. SULEV
 - d. ULEV
6. What is a common cause of high unburned hydrocarbon (HC) emissions?
- a. Faulty catalytic converter
 - b. Lean air–fuel mixture
 - c. Ignition system fault
 - d. Excessive exhaust system pressure
7. Which gas is measured to assess combustion efficiency in an engine?
- a. Carbon monoxide (CO)
 - b. Carbon dioxide (CO₂)
 - c. Hydrocarbons (HC)
 - d. Oxides of nitrogen (NO_x)
8. What causes the formation of NO_x during the combustion process?
- a. High temperatures and pressures
 - b. Insufficient oxygen levels
 - c. Low fuel pressure
 - d. Rich fuel mixture
9. What is the acceptable range for oxygen (O₂) levels in exhaust emissions for a properly operating engine?
- a. 0%–1%
 - b. 1%–3%
 - c. 0%–2%
 - d. 2%–4%

10. Which fault is likely to cause both high HC and CO emissions while CO₂ and O₂ remain low?

- a. Lean mixture
- b. Rich mixture
- c. Faulty EGR valve
- d. Defective fuel pump

Automotive Electrical and Engine Performance 8th Edition
Chapter 26 – Vehicle Emission Standards and Testing
Quiz A

Correct Answers:

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