

Automotive Electrical and Engine Performance 8th Edition
Chapter 3 – Gasoline, Alternative Fuels, and Diesel Fuels
Quiz B

1. What is the primary purpose of catalytic cracking in gasoline production?
 - a. To increase octane levels
 - b. To separate hydrocarbons by boiling point
 - c. To create alternative fuels like biodiesel
 - d. To break down high-boiling hydrocarbons into lower-boiling, more usable hydrocarbons

2. What is the significance of the Reid Vapor Pressure (RVP) in gasoline?
 - a. Determines gasoline's starting performance in cold weather
 - b. Indicates the specific gravity of the fuel
 - c. Measures the vapor pressure of the fuel at 100°F
 - d. Assesses the alcohol content in the fuel

3. Which air-fuel ratio represents the ideal stoichiometric balance for gasoline combustion?
 - a. 8:1
 - b. 14.7:1
 - c. 16.5:1
 - d. 18.5:1

4. What causes spark knock in a gasoline engine?
 - a. Abnormal combustion due to improper ignition timing or low octane fuel
 - b. Over-enrichment of the air-fuel mixture
 - c. Excessive engine cooling
 - d. Faulty oxygen sensors

5. What is the primary advantage of winter-blend gasoline?
- Reduces emissions in cold weather
 - Improves fuel economy during winter
 - Contains higher levels of ethanol for better combustion
 - Vaporizes more easily for better cold-start performance
6. Why is E85 fuel considered environmentally beneficial?
- It reduces CO₂ emissions compared to gasoline
 - It has a higher BTU rating than gasoline
 - It eliminates the need for catalytic converters
 - It contains no hydrocarbons
7. What is the purpose of a variable fuel sensor in a flex-fuel vehicle?
- Adjusts the air-fuel mixture for ethanol content
 - Monitors the stoichiometric ratio of the air-fuel mixture
 - Detects changes in engine vacuum levels
 - Prevents detonation in high-altitude conditions
8. Which fuel is most commonly used in fleet vehicles due to its low emissions and cost?
- Compressed natural gas (CNG)
 - Biodiesel (B20)
 - Propane (LPG)
 - Ethanol (E10)
9. How does altitude affect octane requirements in engines?
- Reduces the octane requirement due to lower atmospheric pressure
 - Increases the octane requirement to compensate for lean mixtures
 - No effect on octane requirements
 - Requires specially blended gasoline with higher volatility

10. What is a key characteristic of ultra-low sulfur diesel (ULSD)?
- a. Contains less than 15 ppm of sulfur to reduce emissions
 - b. Contains higher cetane levels for better cold-start performance
 - c. Blended with 20% biodiesel for enhanced efficiency
 - d. Requires specialized injectors for high-pressure applications

Automotive Electrical and Engine Performance 8th Edition
Chapter 3 – Gasoline, Alternative Fuels, and Diesel Fuels
Quiz B

Correct Answers:

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