Automotive Electrical and Engine Performance 9th 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?

a. Reduces emissions in cold weather

b. Improves fuel economy during winter

c. Contains higher levels of ethanol for better combustion

d. Vaporizes more easily for better cold-start performance

6. Why is E85 fuel considered environmentally beneficial?

a. It reduces CO2 emissions compared to gasoline

b. It has a higher BTU rating than gasoline

c. It eliminates the need for catalytic converters

d. It contains no hydrocarbons

7. What is the purpose of a variable fuel sensor in a flex-fuel vehicle?

a. Adjusts the air-fuel mixture for ethanol content

b. Monitors the stoichiometric ratio of the air-fuel mixture

c. Detects changes in engine vacuum levels

d. Prevents detonation in high-altitude conditions

8. Which fuel is most commonly used in fleet vehicles due to its low emissions and cost?

a. Compressed natural gas (CNG)

b. Biodiesel (B20)

c. Propane (LPG)

d. Ethanol (E10)

9. How does altitude affect octane requirements in engines?

a. Reduces the octane requirement due to lower atmospheric pressure

b. Increases the octane requirement to compensate for lean mixtures

c. No effect on octane requirements

d. 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

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Correct Answers:

1. d

2. c

3. b

4. a

5. d

6. a

7. c

8. a

9. a

10. d