

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

1. What is the primary purpose of gasoline additives?
 - a. Improve combustion efficiency and reduce engine deposits
 - b. Increase the octane rating without chemical changes
 - c. Stabilize fuel in cold climates for better engine operation
 - d. Prevent gasoline evaporation during transportation

2. What is the Reid Vapor Pressure (RVP) test used for?
 - a. Measuring the combustion efficiency of gasoline
 - b. Determining the octane rating of gasoline
 - c. Calculating the sulfur content in gasoline
 - d. Assessing the volatility of gasoline at 100°F

3. What is the stoichiometric air–fuel ratio for gasoline?
 - a. 14.7:1
 - b. 12.6:1
 - c. 18.5:1
 - d. 10:1

4. How does altitude affect the octane rating requirements for gasoline?
 - a. Octane rating requirements increase with altitude due to thinner air.
 - b. Engines require a lower octane rating at higher altitudes due to reduced air density.
 - c. Altitude changes have no impact on octane rating requirements.
 - d. Higher altitudes demand the same octane rating as sea level.

5. Which component of a gasoline engine monitors and adjusts for air–fuel mixture variations?
- Oxygen sensor
 - Knock sensor
 - Throttle position sensor
 - Mass airflow sensor
6. What is a common reason for winter gasoline blends to differ from summer blends?
- Winter blends are formulated to vaporize at lower temperatures for easier starting.
 - Summer blends contain higher ethanol percentages for better performance.
 - Winter blends include additives to prevent freezing.
 - Summer blends reduce the Reid Vapor Pressure to avoid vapor lock.
7. What is the primary function of a catalytic converter in an emission control system?
- Increase the octane rating of gasoline during combustion
 - Reduce carbon monoxide, hydrocarbon, and nitrogen oxide emissions
 - Improve fuel efficiency by recycling exhaust gases
 - Eliminate particulate matter from the combustion process
8. How does E85 fuel compare to traditional gasoline in terms of energy content?
- E85 has a lower energy content, leading to reduced fuel economy.
 - E85 contains more energy per gallon than regular gasoline.
 - E85's energy content is similar, but it burns cleaner.
 - E85 energy content varies greatly depending on the ethanol concentration.
9. What is a potential disadvantage of using biodiesel compared to petroleum-based diesel?
- Increased emissions of carbon monoxide
 - Reduced engine lubrication properties
 - Difficulty starting in colder temperatures due to higher cloud points
 - Lower octane ratings

10. Which property of ethanol allows it to increase the octane rating of gasoline?

- a. High volatility
- b. Oxygenation in the fuel molecule
- c. Increased calorific value
- d. Non-toxicity and environmental friendliness

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Correct Answers:

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