Automotive Technology 7th Edition
Chapter 92
Multiple Choice Quiz B

Name: _____ Date: _____

1. Ultracapacitors are particularly suited for:
A. Long-term energy storage
B. Sudden bursts of energy
C. Prolonged discharge cycles
D. High specific energy applications

2. The electrolyte used in PEM fuel cells is:
A. Sulfonic acid in polymer
B. Orthophosphoric acid
C. Li and K carbonates
D. Yttrium-stabilized zirconia

3. The operating temperature range for a PEM fuel cell is:
A. 176–212°F (80–100°C)
B. 360–410°F (180–210°C)
C. 1100–1300°F (600–700°C)
D. 1200–3300°F (650–1800°C)

4. The electric efficiency of a PEM fuel cell is approximately:
A. 30% to 40%
B. 40%
C. 43% to 44%
D. 50% to 60%

5. What is the primary advantage of a fuel cell vehicle?
A. High specific energy
B. Zero carbon emissions
C. High power density
D. Cold weather starting capability

6. The PEM fuel cell is known for its:
A. High operating temperature
B. Ability to operate at ambient temperatures
C. Use of natural gas as the primary fuel
D. High electric efficiency at low temperatures

7. The negative electrode in a PEM fuel cell is responsible for:
A. Distributing oxygen over the membrane surface
B. Removing waste heat
C. Generating electricity
D. All of the above

8. The main emissions from a PEM fuel cell are:
A. Water and waste heat
B. CO_2 and water vapor
C. Hydrocarbons and CO
D. Nitrogen oxides and particulates

9. Fuel-cell stacks are used to:
A. Increase the voltage output
B. Decrease the fuel consumption
C. Reduce the size of the fuel cell system
D. Enhance the electrolyte efficiency

10. The primary challenge in adopting fuel cells as a mainstream technology is:
A. High cost and lack of refueling infrastructure
B. Insufficient vehicle range and lack of durability
C. Cold weather starting problems and insufficient power density
D. All of the above

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Answer Key

1. B

2. A

3. A

4. A

5. B

6. B

7. D

8. A

9. A

10. D