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LMS: Hybrids & EV Systems – Automotive Fundamentals Quiz

1. What powers a fully electric vehicle (EV)?
A. Gasoline engine only
B. Diesel engine
C. Battery and electric motor
D. Transmission system
Correct Answer: C. Battery and electric motor
Explanation: EVs rely entirely on stored electrical energy to power a traction motor.

2. What is the main function of a traction motor in an EV?
A. Charge the battery
B. Convert electrical energy into mechanical motion
C. Cool the system
D. Control fuel delivery
Correct Answer: B. Convert electrical energy into mechanical motion
Explanation: The motor turns electricity into rotational force to drive the wheels.

3. What happens during regenerative braking?
A. Energy is wasted as heat
B. Engine power increases
C. Kinetic energy is converted back into electrical energy
D. Fuel consumption increases
Correct Answer: C. Kinetic energy is converted into electrical energy
Explanation: Regenerative braking captures energy and stores it back in the battery.

4. In a series hybrid system, what does the internal combustion engine (ICE) do?
A. Drives the wheels directly
B. Charges the battery only
C. Controls steering
D. Powers the transmission
Correct Answer: B. Charges the battery only
Explanation: The ICE acts as a generator and does not directly drive the wheels.

5. In a parallel hybrid system, how is the vehicle powered?
A. Electric motor only
B. Engine only
C. Both the engine and electric motor
D. Battery only
Correct Answer: C. Both the engine and electric motor
Explanation: Both systems can work together to move the vehicle.

6. What is a series-parallel hybrid (like a Prius)?
A. Only electric drive system
B. Only engine-driven system
C. A system that can use both series and parallel operation
D. A non-hybrid system
Correct Answer: C. A system that can use both series and parallel operation
Explanation: It can switch between or combine both modes for efficiency.

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7. What is the purpose of a power splitter in hybrid systems?
A. Increase fuel pressure
B. Divide power between engine and motor systems
C. Cool the battery
D. Control braking
Correct Answer: B. Divide power between engine and motor systems
Explanation: It distributes power to drive wheels or charge the battery.

8. What does BAS / BSG / ISG refer to in mild hybrid vehicles?
A. Fuel control system
B. Belt-driven starter generator system
C. Air conditioning system
D. Transmission control module
Correct Answer: B. Belt-driven starter generator system
Explanation: These are different names for the same 48V starter-generator technology.

9. What is the typical voltage range of a mild hybrid system?
A. 12V only
B. 24V only
C. 36V–52V (nominal 48V)
D. 300V only
Correct Answer: C. 36V–52V
Explanation: Mild hybrids operate around 48V but can fluctuate within this range.

10. Why is safety critical when working on EV and hybrid systems?
A. They use low voltage only
B. They contain high-voltage components that can be dangerous
C. They don't require training
D. They are identical to 12V systems
Correct Answer: B. High-voltage components
Explanation: Systems can exceed 300V, requiring proper procedures and PPE.