

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:3170216

Date:27-05-2025

Subject Name:Electric, Hybrid and Fuel Cell Vehicles

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is the Environmental and social importance of electric vehicles?	03
	(b) Discuss fuel efficiency analysis in hybrid electric drive-trains.	04
	(c) Explain Power flow control in hybrid drive-train topologies with a neat sketch.	07
Q.2	(a) Write a short history of electric vehicles.	03
	(b) Explain Hybrid traction.	04
	(c) Explain various Electric drive-train topologies.	07
	OR	
	(c) Write a short note on Highspeed Flywheel.	07
Q.3	(a) Which are the Parameters affecting battery performance?	03
	(b) Describe the Torque control of BLDC Motor Drives.	04
	(c) Enlist types of batteries and explain Lithium batteries with a neat sketch.	07
	OR	
Q.3	(a) What is the limitation of Parallel motors?	03
	(b) Explain the Sizing of the Propulsion motor.	04
	(c) Discuss the configuration and control of Induction Motor drives.	07
Q.4	(a) Explain the working of the Ultra-capacitor.	03
	(b) Explain Molten carbon fuel cell	04
	(c) Explain the Configuration and control of Permanent magnet motors and Switched reluctance motors	07
	OR	
Q.4	(a) Explain Power steering units.	03
	(b) Describe Battery characteristics.	04
	(c) Write a short note on the Proton exchange membrane fuel cell with a neat sketch.	07
Q.5	(a) What is the latest Vehicle Communication technique used in today's vehicle?	03
	(b) Classify different Energy management strategies.	04
	(c) Describe the Hydrogen storage system.	07
	OR	
Q.5	(a) Explain auxiliary Power supplies.	03
	(b) Discuss Regenerative braking system	04
	(c) Write a short note on the Temperature control unit in lithium batteries.	07

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