

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3170216

Date:16-12-2024

Subject Name: Electric, Hybrid and Fuel Cell Vehicles

Time:10:30 AM TO 01:00 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 vehicle?	03
	(b) Discuss fuel efficiency analysis in hybrid electric drive-trains.	04
	(c) Explain Power flow control in hybrid drive-train topologies with neat sketch.	07
Q.2	(a) Write short history of electric vehicle.	03
	(b) Explain Hybrid traction.	04
	(c) Explain various Electric drive-train topologies.	07
	OR	
	(c) Write 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 battery with neat sketch.	07
	OR	
Q.3	(a) What is the limitation of Parallel motor?	03
	(b) Explain Sizing the Propulsion motor.	04
	(c) Discuss configuration and control of Induction Motor drives.	07
Q.4	(a) Explain working of Ultra-capacitor.	03
	(b) Explain Molten carbon fuel cell	04
	(c) Explain Configuration and control of Permanent magnet motor and Switched reluctance motors	07
	OR	
Q.4	(a) Explain Power steering units.	03
	(b) Describe Battery characteristics.	04
	(c) Write short note on Proton exchange membrane fuel cell with neat sketch.	07
Q.5	(a) What is latest Vehicle Communication technique used in today's vehicle?	03
	(b) Classify different Energy management strategies.	04
	(c) Describe Hydrogen storage system.	07
	OR	
Q.5	(a) Explain auxiliary Power supplies.	03
	(b) Discuss Regenerative braking system	04
	(c) Write short note on Temperature control unit in lithium batteries.	07

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