

GUJARAT TECHNOLOGICAL UNIVERSITY**BE MINOR - SEMESTER-V EXAMINATION – SUMMER 2024****Subject Code:115AL01****Date:27-05-2024****Subject Name:Power Electronics for Electrical 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) Explain parallel hybrid electric drive train.	03
	(b) Explain construction and working of hybrid electrical vehicle.	04
	(c) Elaborate the use of power electronics converters in electrical vehicles.	07
Q.2	(a) Explain series hybrid electric drive train.	03
	(b) Explain IGBT as power electronics switch in brief with neat and clean diagrams.	04
	(c) Elaborate components of drive train in electrical vehicles.	07
	OR	
	(c) Explain voltage source inverter for electrical vehicle giving example of driving electric motor.	07
Q.3	(a) Draw symbol of MOSFET, IGBT and power diode to used in electrical vehicle.	03
	(b) Elaborate the working of SRM with neat and clean diagram.	04
	(c) Enlist and elaborate the use of different types electrical machines in electrical vehicles.	07
	OR	
Q.3	(a) Give types of battery. Explain any one in details.	03
	(b) Explain construction, working and characteristic of IGBT.	04
	(c) Explain Traction motor characteristics.	07
Q.4	(a) Enlist the characteristics and behaviour requirements of electrical motor drives used in electrical vehicles.	03
	(b) Elaborate the method of power calculation of electrical motor in case of electrical vehicles.	04
	(c) Compare Series and Parallel Hybrid Drive train.	07
	OR	
Q.4	(a) Explain working principle of 3-phase Induction motor.	03
	(b) What is fuel Cell? Write advantages of it compared to other energy sources used in Electric Vehicle.	04
	(c) Elaborate the working of 3-phase rectifier for electrical vehicles.	07
Q.5	(a) Elaborate how battery capacity is found for electrical vehicles.	03
	(b) Give classification of battery management system.	04
	(c) Elaborate how control system functions in hybrid electrical vehicles.	07
	OR	
Q.5	(a) Elaborate how battery capacity is found for hybrid electrical vehicles.	03
	(b) Elaborate different types of charging station.	04
	(c) Enlist different fuel cells and explain any one in detail.	07