GUJARAT TECHNOLOGICAL UNIVERSITY WINTER 2016 .

$ME = SEMESTER IV (NEW) = \bullet EXAMINATION = WINTER 2016$			
Subject Vole: 2/44505 Date: 20/1 Subject Name: Flectric Vehicles			10
Time:02:30 pm to 05:00 pm Total Marks		70	
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	With functional block diagram explain typical electric propulsion system. With diagram explain conceptual illustration of general EV configuration.	07 07
Q.2	(a) (b)	With diagram explain conceptual illustration of a hybrid electric drive train. With diagram explain configuration of a series hybrid electric drive train. OR	07 07
	(b)	With diagram explain two-axle configuration of parallel hybrid electric drive train.	07
Q.3	(a)	With diagram explain pretransmission single-shaft torque combination parallel hybrid electric drive train.	07
	(b)	Give the classification of electric motor drives for EV and HEV applications. OR	07
Q.3	(a)	Explain principle of operation of a step down (or class A) chopper with basic chopper circuit and waveforms.	07
	(b)	With diagram explain general configuration of constant V/f control of induction motor.	07
Q.4	(a) (b)	With general block diagram explain vector control system for an induction motor With block diagram explain torque control of the BLDC motor. OR	07 07
Q.4	(a) (b)	With waveform explain low-speed (below the base speed) operation of SRM. Explain the design of Z-converter for battery charging.	07 07
Q.5	(a) (b)	Give the types of Fuel Cells. Explain construction and operation PEMFC. Derive the equation for isolated bidirectional DC–DC converter for heavy load condition with necessary waveforms.	07 07
05	(9)	OR Explain the plot of battery voltage and charging current Vs. State of charge (SOC)	07
V •2	(a)	for a three stage charger.	07
	(b)	Give the types of energy storage technologies suitable for hybrid electrical vehicle. Explain the Lithium-Ion battery in detail.	07
