U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**

Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**

Course Code: 22EE7PE3VT **Max Marks: 100**

Course: Electric Vehicle Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Differentiate the various speed control methods in DC Motor.	*CO1*	*PO1*	**12**
	b)		Compare the different considerations of Electric Vehicle.	*CO1*	*PO1*	**08**
			OR			
2	a)		Explore the advantages and challenges of Permanent Magnet motors.	*CO1*	*PO2*	**10**
	b)		Explain the control methods, advantages and applications of Induction motor.	*CO1*	*PO2*	**10**
			UNIT - II			
3	a)		Compare the rectifiers used in Hybrid Electric Vehicles.	*CO1*	*PO3*	**10**
	b)		Which DC - DC Converter is used in the Hybrid Electric Vehicle and explain its working principle.	*CO1*	*PO3*	**10**
			OR			
4	a)		Derive the output voltages for buck converter and boost converter used in non isolated bidirectional DC - DC converter.	*CO1*	*PO3*	**10**
	b)		Distinguish onboard chargers and off board chargers.	*CO1*	*PO3*	**10**
			UNIT - III			
5	a)		Write a short note on types of batteries.	*CO1*	*PO1*	**10**
	b)		Explore various battery parameters for EV applications.	*CO1*	*PO1*	**10**
			OR			
6	a)		Describe any one method to estimate the State of Charge of Li-ion battery. Bring out its advantages and disadvantages.	*CO1*	*PO1*	**10**

		b)	Design a battery management system for Electric Vehicle application.	*CO1*	*PO1*	**10**
			UNIT - IV			
	7	a)	Discuss the general components in PWM converter with a neat diagram	*CO2*	*PO2*	**10**
		b)	Explain the average state space model of a PWM converter.	*CO2*	*PO2*	**10**
			OR			
	8	a)	Estimate the current ripple and the torque ripple in inverter fed drives.	*CO2*	*PO3*	**10**
		b)	Write a short note on constant V/F induction motor drives.	*CO2*	*PO3*	**10**
			UNIT - V			
	9	a)	Distinguish slow charging and fast charging.	*CO3*	*PO4*	**10**
		b)	Demonstrate each part in the basic block diagram of the charger in an Electric Vehicle.	*CO3*	*PO4*	**10**
			OR			
	10	a)	Discuss the solar charging stations for Electric Vehicles.	*CO3*	*PO4*	**10**
		b)	What are the components of EV charging Infrastructure and explain each and every part in it.	*CO3*	*PO4*	**10**

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