Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Seventh Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEE0015: Drives for Electric Vehicle

COURSE OUTCOMES

CO1: Distinguish the types and components of Electric Vehicles (EV).

CO2: Design and analyze PMBLDC motor drive for EV.

CO3: Formulate control strategies and analyze PMSM motor drive for EV.

CO4: Develop and analyze induction motor drive for EV.

CO5: Compare and choose the energy storage devices and charging methods for EV.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Name the Components of Electric vehicle.		CO1	[K_1]
2.	Draw the Drive cycle characteristics of Electric vehicle.		CO1	[K_2]
3.	Compare BLDC and PMSM Motor.		CO2	[K_3]
4.	List out the Various types of PM materials used in Electric Vehicles.		CO2	[K_1]
5.	Write the expression for torque of PMSM motor.		CO3	[K_2]
6.	Define Vector control method.		CO3	[K_1]
7.	Compare field-oriented control and Direct torque control method.		CO4	[K_3]
8.	List the advantages and disadvantages of 3 phase induction motor.		CO4	[K_2]
9.	Which parameter affects the charging time of EV?		CO5	[K_2]
10.	Define smart charging system.		CO5	[K_1]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Classify Electric Vehicle based on fuel, Propulsion and Vehicle type.	8	CO1	[K_2]
	b)	Draw and explain pure Battery powered Electric Vehicle.	8	CO1	[K_2]

12.		With neat sketch explain the structure and operation of BLDC motor.	16	CO2	[K_2]
13.		Draw and explain self-control technique of PM Synchronous motor drive.	16	CO3	[K_2]
14.		Sketch the cross-sectional view and operation of 3 phase induction motor.	16	CO4	[K_2]
15.		With neat sketch Explain the Charging system of EV batteries.	16	CO5	[K_2]
16.	a)	List the Factors influencing selection of motor Drive for EV.	8	CO1	[K_3]
	b)	Describe the requirements of Electric Vehicle.	8	CO1	[K_2]

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