Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEE0013: Electric Vehicle Technology

COURSE OUTCOMES

CO1: Gain the knowledge on the fundamentals and benefits of Electric vehicles
CO2: Understand the performance of various subsystems in Electric vehicles
CO3: Analyze the choice of Electric motor drive technologies used in Electric vehicles
CO4: Compare and select the appropriate energy source for Electric vehicles
CO5: Acquire the concepts of grid connected technologies

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

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

1.	Compare Electric Vehicles with Conventional IC Engine based vehicles.	CO1	[K_1]
2.	Name any two Electric Cars manufactured in India.	CO1	[K_1]
3.	How many types of Electric vehicles are there and name them.	CO2	[K_1]
4.	List the function of On Board Charger (OBC) in Battery electric Vehicle.	CO2	[K_2]
5.	Outline the block diagram of Switched Reluctance motor (SRM) drive.	CO3	[K_2]
6.	Name the types of DC-DC converters used in Electric vehicles.	CO3	[K_1]
7.	Why Li-ion batteries are used in Electric Vehicles? Justify.	CO4	[K_1]
8.	Interpret the concept of Battery Swapping.	CO4	[K_2]
9.	How much time does it take an Electric Vehicle battery to charge?	CO5	[K_2]
10.	Mention the challenges of Vehicle to Grid (V2G) technology.	CO5	[K_2]

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

11.	a)	Draw and explain the architecture of Electric Vehicle.	8	CO1	[K_2]
	b)	Compare and differentiate between the Battery Electric Vehicle (BEV), Hybrid Electric Vehicle (HEV), and Plug in HEV (PHEV) technologies.	8	CO1	[K_2]

12.	a)	What is tractive effort? Explain aerodynamic drag force in detail.	8	CO2	[K_2]
	b)	Describe the power flow control of power train components for Electric Vehicle.	8	CO2	[K_2]
13.	a)	Illustrate the working of Permanent Magnet Brushless DC motor drive and mention the advantages and disadvantages of BLDC drive.	10	CO3	[K_2]
	b)	Compare Mechanical commutator with Electronic commutator.	6	CO3	[K_2]
14.	a)	What are the requirements of EV battery? List the types of batteries used in Electric Vehicles.	4	CO4	[K_2]
	b)	Describe the construction and working of Lead acid battery with a neat sketch.	12	CO4	[K_2]
15.	a)	Write a short note on Electric Vehicle charging standards.	4	CO5	[K_1]
	b)	List the main components of an Electric Bicycle and Explain how the E-Bicycle works.	12	CO5	[K_2]
16.	a)	Describe the primary and secondary function of Battery Management System (BMS).	8	CO4	[K_2]
	b)	Explain the Control Strategies of the DC-DC power converter in detail.	8	CO3	[K_2]

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