QP Code: RN21BTECH587 | Reg. No | | | | | | | | | | | AR 21

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Seventh Semester - Regular) Examinations, November – 2024

21BEEPE47021 – Hybrid Electric Vehicles

(Electrical and Electronics Engg.)

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	List the factors considered while selecting a suitable power plant.	CO1	K1
b.	Mention advantages and disadvantages of series hybrid electric drive train.	CO2	K1
c.	Draw the general configuration of an electric vehicle.	CO2	K1
d.	Define "State of Charge".	CO3	K1
e.	Explain Simpson type transmission.	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

		Marks	CO #	Blooms Level
	Answer ***All*** the questions			
2. a.	Define ICE. Draw & explain the characteristic curve of an ICE.	8	CO1	K2
b.	Describe the social and environmental effects of hybrid electric vehicles.	7	CO1	K2
	(OR)			
c.	Describe the general configuration of electric vehicle with block diagram.	8	CO1	K2
d.	State and explain the dynamic equation of vehicle motion.	7	CO1	K2
3.a.	With help of block diagram, explain different modes of operations of a typical parallel hybrid train.	8	CO2	K2
b.	Describe the need and importance of electric and hybrid electric drive train.	7	CO2	K2
	(OR)			
c.	With help of block diagram, explain different modes of operations of a typical series hybrid train.	8	CO2	K2
d.	Explain different EV configurations.	7	CO2	K2
4.a.	Explain the forward motoring and regenerative braking control of a dc motor with a single chopper. Give circuit diagram and show the quadrants of operation.	8	CO3	K2
b.	Write short notes on Hybridization of different energy storage devices.	7	CO3	K2
	(OR)			
c.	Explain with neat cell structure the reactions during charging and discharging of the nickel cadmium battery.	8	CO3	K2
d.	With the help of neat figures explain the general configuration of constant v/f control of induction motors.	7	CO3	K2
5.a.	Classify and explain the basic principle of Rule based energy management system. Elaborate on any one of the Rule based energy management system.	8	CO4	K2
b.	Explain Different types of automatic type transmission.	7	CO4	K2
	(OR)			
c.	What are the problems taken into account in the development of HEV energy management strategies? Explain.	8	CO4	K2
d.	Classify different energy management strategies.	7	CO4	K2

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