Hall Ticket Number :										

R-19

Code: 19A27ET

IV B.Tech. I Semester Regular Examinations November 2023

Hybrid Electric Vehicles

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Answer *five* questions by choosing one question from each unit (5 x 14 = 70 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	With the help of a neat block diagram explain different subsystems of electric drive train.	7M	CO1	L2
	b)	Illustrate the various types of hybrid electric vehicles	7M	CO1	L2
		OR			
3.	a)	Discuss the impact of modern drive trains on energy supplies.	7M	CO1	L2
	b)	Illustrate the mathematical models to describe the vehicle performance.	7M	CO1	L3
		UNIT–II			
4.	a)	Which are the resistive forces that retard the motion of a four-wheel vehicle? Show with a diagram.	7M	CO2	L2
	b)	Discuss briefly the electrical and mechanical constraints to be considered while sizing an electrical machine for an EV.	7M	CO2	L2
		OR			
5.	a)	Derive the expression for Tractive Effort in Electric Vehicle?	7M	CO2	L4
	b)	Discuss the issue that is related to the design of Electric Vehicle?	7M	CO2	L6
		UNIT–III			
6.	a)	Illustrate the modeling of batteries.	6M	CO2	L2
	b)	Discuss the following: specific energy (ii) specific power (iii) Ragone plot	7M	CO2	L2
		OR			
7.	a)	Describe the terms State-of-Charge and Depth-of-Discharge as applied to batteries.	7M	CO3	L2
	b)	Discuss the sizing procedures of energy storage systems for electric hybrid vehicle.	7M	CO3	L2
		UNIT–IV			
8.	a)	Illustrate the challenges and key technology of Hybrid Electric Vehicles	7M	CO4	L2
	b)	Describe the advantages and disadvantages of Hybrid Electric Vehicles	7M	CO4	L2
		OR			
9.	a)	Discuss the design and control principles of Plug-In Hybrid Electric Vehicles	7M	CO4	L2
	b)	Illustrate the architectures of Hybrid Electric Vehicles	7M	CO4	L2
		UNIT–V			
10.	a)	Describe the different power flow control modes of a typical parallel hybrid system with the help of block diagrams.	7M	CO5	L2
	b)	Illustrate the mechanism of hybrid electric heavy-duty vehicles	7M	CO5	L2
		OR			
11.		Discuss the various steps involved in the electric vehicle case study	14M	CO5	L2

*** End ***

Hall Ticket Number :										

R-19

Code: 19A272T

IV B.Tech. I Semester Supplementary Examinations November 2023

Power Semiconductor Drives

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.		Discuss the operation of Three phase fully controlled converter fed separately excited dc motor for continuous current operation and draw the output voltage and current waveforms.	14M	CO1	BL2
		OR			
2.		Derive the output voltage equation and draw the speed torque characteristics of Single phase semi controlled converter fed dc series motor.	14M	CO1	BL3
		UNIT–II			
3.		Discuss the Four-quadrant operation of an electrical drives with suitable application.	14M	CO2	BL2
		OR			
4.		Discuss the Four quadrant operation of D.C motors by dual converters.	14M	CO2	BL2
		UNIT–III			
5.	a)	Discuss the operation of a chopper fed dc drive in first quadrant and draw the waveforms.	7M	CO3	BL3
	b)	ADC Series motor fed from 400V dc source through a chopper, has the following parameters. Ra = 0.075Ω, Rs = 0.1Ω, k = $5*10^{-3}$ Nm/amp2. The average armature current of 150A ripple free. For a chopper duty cycle of 50%. Determine i) Input power from the source ii) Motor speed.	7M	CO3	BL3
		OR			
6.		Discuss the operation of four quadrant chopper fed dc separately excited motor.	14M	CO3	BL2
		UNIT–IV			
7.	a)	Draw the speed –torque characteristics of a rotor resistance controlled induction motor and discuss the draw backs of static rotor resistance control method.	7M	CO5	BL4
	b)	Discuss the operation of static Kramers drive system with neat sketch.	7M	CO5	BL2
		OR			
8.	a)	What is the necessity of Slip power Recovery scheme	7M	CO5	BL2
	b)	Distinguish between Static Scherbius drive and Static Kramers drive.	7M	CO5	BL4
		UNIT–V			
9.		How do you control synchronous motor with cyclo converter? Explain with neat waveforms.	14M	CO5	BL2
		OR			
10.		How the load commutated inverter can be employed for starting of synchronous motor .Discuss briefly.	14M	CO5	BL2

END

Hall Ticket Number :										

R-19

Code: 19A27IT

IV B.Tech. I Semester Supplementary Examinations Nov/Dec 2023

Distribution of Electrical Power

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Derive the relationship between Load factor and Loss factor 7M

   b) The average load factor of a substation is 0.65 then determine the average loss factor of its feeders if the substation services (i) an urban area and (ii) a rural area 7M

OR

2. a) Discuss the Classification of loads and their characteristics 7M

   b) Explain about Load modeling and its characteristics 7M

UNIT–II

3. a) Derive the expression for Voltage drop and Power loss for uniformly loaded distributor fed at one end 7M

   b) A DC two wire distributor of length 1Km is loaded uniformly at 2A/m run. The distributor is fed at one end at 220V. if the loop resistance is $3*10^{-5}$ Ω/m then determine the voltage drop at a distance of 250m from the feeding station. Also calculate the voltage drop at far end of the distributor 7M

OR

4. a) List out the factors affecting the primary feeder voltage levels and primary feeder loading 7M

   b) A 1-Φ distributor 2Km long supplies a load of 120A at 0.8pf lag at its far end and a load of 80A at 0.9pf lag at its midpoint. Both the power factors are referred to the voltage at the far end. The impedance per Km for go & return is (0.05+j0.1)Ω/Km. If the voltage at the far end is maintained at 230V then determine the following
   (i) Voltage at the sending end
   (ii) Phase angle difference between the voltages at both the ends 7M

UNIT–III

5. a) Derive the expression for rating of the distribution substation 7M

   b) List out the differences between Indoor and Outdoor substations 7M

OR

6. Explain the single bus bar and sectionalized single bus bar arrangement with relevant diagrams 14M

UNIT–IV

7. a) Define Power factor and list out the various factors for causes of Low Power factor 7M

   b) Explain the procedure to determine the optimum capacitor allocation 7M

OR

8. a) Derive the relation showing the dependency of voltage on Reactive Power flow 7M

   b) List out the various methods of voltage control and explain any one of them in detail 7M

UNIT–V

9. a) List out the objectives of Distribution system protection 7M

   b) Explain the principle of operation of circuit breaker along with a neat labeled diagram 7M

OR

10. Explain the different types of faults and procedure for fault calculation 14M

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