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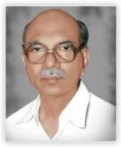
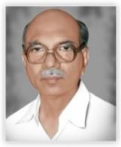


DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-AI, IOT

QUESTION BANK

III B.TECH – I SEM **QUESTION BANK** **SUB: EV** **AY: 2023 – 24**

Q.No	Question	CO No	K level
	UNIT – I		
1.a	Describe past, present and future EV developments. (5M)	1	K3
1.b	Explain the modern EV concept. (5M)	1	K2
2.a.	Analyze various key technologies of Electric vehicles. (5M)	1	K4
2.b.	State and explain the dynamic equation of vehicle motion (5M) OR Explain the term rolling resistance and aerodynamic drag in vehicles and derive the expression for vehicle translational speed from fundamentals.(10M)	1 1	K3 K3
3.	Explain in detail the State-of-the art (recent stages in development) EVs. (10M)	1	K3
4.	Sketch the block diagram of EV configuration and briefly explain various sub-systems of EV(Electric propulsion, Energy source). (10M)	1	K3
5.a	Analyze fixed and variable gearing system with force-speed characteristics. (5M)	1	K4
5.b	Explain historical background of EV and HEV technology involvement.(10M)	1	K3
6.a	Explain with neat diagrams single and multiple motor drives. (5M)	1	K3
6.b	Distinguish between inner rotor in-wheel drive and outer rotor in-wheel drive. (5M)	1	K3
	UNIT – II		
1.a	Explain Electromobilty and how it is benefited to the environment.(5M)	2	K3
1.b	What do you understand about greenhouse effect(global warming).(5M)	2	K2
2.a	Describe the history of electric power trains. (5M) (or) Discuss various electric drive train topologies.	2 2	K3 K3
b.	Explain the impacts of EV on Power grid, Environment and Economy.(5M)		
3.	Analyse carbon emissions from fuels and pollutants. (10M)	2	K3
4.	Explain about i) Internal Combustion Engine vehicles (ICEVs) ii) Battery vehicles (10M)	2	K3
5.	Explain about i) Hybrid Electric Vehicles (HEVs) ii) Fuel cell vehicles (10M)	2	K3
6.	Compare ICEVs, Battery, HEVs, Fuel cell Vehicles. (10M)	2	K4



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7.	Explain the impacts of EV on Power grid, Environment and Economy.	2	K3

UNIT – III

1.a	Sketch and explain block diagram of an electric propulsion system.(5M)	3	K3
1.b	Why EV motors are so unique that they are deserved to form an individual class. (Concept of EV motors).(5M)	3	K1
2.a	Explain about Single- or multiple-motor configurations.(5M)	3	K3
2.b	Explain about Fixed- or variable-gearing transmissions. (5M)	3	K3
3.	Explain briefly about i) In wheel motor configurations ii) Classify EV motors.(10M)	3	K3
4.	Explain about i) Recent EV motors and evaluation. ii) Vehicle load factors .(10M)	3	K3

UNIT – IV

1.a	Sketch and explain the construction and working operation of Fuel cell.(5M)	4	K3
1.b	Explain about Fuel cell Thermodynamics(model, voltage, power and efficiency of Fuel cell). (5M)	4	K3
2.a	Explain the power plant system characteristics.(5M)	4	K3
2.b	Explain the sizing of Fuel cell. (5M)	4	K3
3.	Explain different HEV configurations with neat block diagrams.(10M)	4	K3
4.a	Compare series and series-parallel HEVs.(5M)	4	K3
4.b	Explain Fuel cell Electric vehicle with an example.(5M)	4	K3

UNIT – V

1.a	Describe basic requirements of battery charging.(5M)	5	K3
1.b	Sketch charger architecture with explanation of its functions. (5M)	5	K3
2.	Explain briefly about i)wireless charging	5	K3
	ii)Power factor correction.(10M)	5	K3
3.	Explain modelling of Electromechanical system using feedback control design approach.(10M)	5	K4
4.a	Design PI controller.(5M)	5	K5

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4.b	Explain about torque loop and speed control loop compensation.(5M)	5	K3
5.	a) What are the different modes of charging batteries. Compare them in detail.(5M)	5	K3
	b)Design a position control loop.(5M)	5	K5

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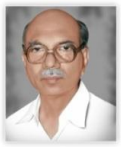

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QUESTION BANK

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2 MARKS QUESTIONS

Q.No	Question
	UNIT – 1
1.	a) Define any two weight parameters. b) Define any two size parameters. c) Define any two Force parameters. d) Define any two Energy parameters. e) Define any two performance parameters. f) List the types of EV system. g) Mention the factors involved in the braking performance of the vehicle. h) Mention the types of EV configurations. i) List the factors involved in the vehicle performance.
	UNIT – 2
2.	a) Explain the basic principle of Fuel Cell. b) What is Electromobilty? c) What is Green house effect? d) Draw the block diagram of an EV system. e) Sketch the block diagram of a Fuel cell based EV. f) Compare the conventional battery with fuel cell electric system. g) What are the effects of green house? i) Specify the various components of DC drive j) State the main reason for fuel economy in hybrid electric vehicle
3.	**UNIT – 3**
	a) What is meant by Electric propulsion? b) Write any two differences between EV motor and Industrial motor. c) Compare single and dual motor configuration. d) Compare Fixed and variable gearing transmission. e) Classify EV motors with the help of block diagram. f) Why DC series motor suitable for traction applications. g) What is vehicle load factor. h) Why squirrel cage induction motor more attractive in EV.

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UNIT – 4

4. a) What are the types of Fuel cells?
b) Sketch the block diagram of a Fuel cell system.
c) Sketch the block diagram of Series-parallel HEV.
d) What is Hybrid Electric Vehicle?
e) Define brake specific fuel consumption.
f) Write down the formula for efficiency of fuel cell.
g) List the types of HEV.

UNIT – 5

5. a) Classify AC charging systems.
b) Classify DC charging systems.
c) Sketch the block diagram of on-board battery charger.
d) Sketch the equivalent circuit and block diagram of DC motor with mechanical load.
e) What are the controller objectives?
f) Sketch the block diagram of Cascaded control structure.
g) Sketch the feedback controlled drive.
h) List the types of batteries are used in the storage system.
i) Compare the different types of wireless charging systems.
j) Why battery management system is required in electric vehicle.
k) Specify the charging methods of the electric vehicle.