



R20 Regulation

Subject code: 3E7BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Regular Examinations, November 2023

HYBRID ELECTRICAL VEHICLES (Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 12.12.2023 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

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1	Define conventional system.	L1
2	What is meant by Rolling Resistance of a vehicle?	L1
3	What is Meant by Hybrid Electric Vehicle?	L1
4	What is the social importance of HEV?	L1
5	What are the Indicators of vehicle performance?	L1
6	What is drive system efficiency?	L1
7	What is sizing the propulsion motor?	L1
8	What are different modes of charging batteries?	L1
9	List out energy management strategies for EVs?	L1
10	List out major issues in energy management of EHV's?	L1

Part-B

Answer All the following questions.

(5X10M=50Marks)

11	A. Write the various attributes of vehicle performance? (5M) B. Explain Transmission Characteristics of vehicles? (5M)	L2 L2
OR		
12	Explain the term rolling resistance and aerodynamic drag in vehicles and derive the expression for vehicle translational speed from fundamentals? (10M)	L3
13	A. Explain the socio-economic importance of a Hybrid Electric Vehicle? (5M) B. Explain the impact of modern Drive trains on energy supplies? (5M)	L3 L2
OR		
14	Explain power flow control in series hybrid Electric drive-train. List out the advantages and disadvantages. (10M)	L3
15	Draw and explain the block diagram of switched reluctance motor drive system(10M)	L3
OR		
16	Discuss various electric drive train topologies? (10M)	L3
17	A. Discuss Fuel Cell based energy storage and its analysis? (5M)	L3

	B. Explain about Energy Storage Requirements in Hybrid Electric Vehicles? (5M)	L3
	OR	
18	A. Explain the super capacitor-based energy storage and also state its limitations? (5M) B. Explain Hybridization of different energy storage devices? (5M)	L3 L2
19	Classify and explain the different energy management strategies? (10M)	L3
	OR	
20	With neat sketch, explain design considerations of a Battery Electric Vehicle (BEV). (10M)	L3