



R20 Regulation

Subject code: 3E7BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, December 2024

HYBRID ELECTRICAL VEHICLES (Electrical and Electronics Engineering)

Maximum Marks: 70

Date:30.12.2024 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)	Bloom Tx
1	Define conventional system.		L1
2	What type of transmission system is used in electric vehicle?		L1
3	Define Hybrid Electric Vehicle.		L1
4	What are the advantages 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	Compare rule based and fuzzy energy management strategies.		L1
10	List out major issues in energy management of EHV's?		L1

Part-B

Answer All the following questions.		(5X10M=50Marks)	
11	Obtain the mathematical modeling of electric vehicle to describe its performance. (10M)		L2 L2
OR			
12	Briefly discuss about the social and environmental importance of hybrid and electric vehicles. (10M)		L2
13	Describe the basic concept of hybrid traction and various hybrid drive-train topologies. (10M)		L2
OR			
14	Develop the power flow control in electric drive-train topologies with neat architecture. Also examine the fuel efficiency analysis. (10M)		L2
15	List the types of electric motors used in hybrid and electric vehicles. How the electric motors used in EVs differs from that of used in industrial application? (10M)		L3
OR			
16	Draw and explain the block diagram of switched reluctance motor drive system.(10M)		L3

17	Write the need for energy storage requirements in hybrid and electric vehicles. Differentiate between ultra-capacitor and battery as an energy storage device for EV in detail. (10M)	L2
	OR	
18	Illustrate the flywheel based energy storage and its analysis with suitable sketch. (10M)	L2
19	Classify and explain the different energy management strategies? (10M)	L3
	OR	
20	Explain the design of a Hybrid Electric Vehicle (HEV) as a case study. (10M)	L3