R18 Regulation *Subject code:2E7BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, December 2024

HYBRID ELECTRIC VEHICLES

(EEE)

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)		CO	Bloom Tx
1	Define Hybrid Electric Vehicles?	1	L1
2	What is Hydrogen Fuel Cell Vehicle	1	L1
3	Define Electric Traction.	2	L1
4	What is Hybrid Electric Drive Train?	2	L1
5	Define Torque.	3	L1
6	Write the Induction Motor principle?	3	L1
7	Define Lithium battery.	4	L1
8	Define Energy Storages System in Hybrid Electric Vehicles.	4	L1
9	Write the Definition of Energy Management Strategies?	5	L1
10	Define CAN (Control Area Network).	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Explain the term rolling resistance and aerodynamic drag in vehicles and derive the Expression for vehicle translational speed from fundamentals. [10M]	1	L2
	OR		
12	a) Write basic performance of conventional system in automotive systems. [5M] b) What are the advantages and disadvantages of conventional vehicles. [5M]	1	L2
13	Explain Social and environmental importance of hybrid and electric vehicles. [10M]	2	L2
	OR		
14	Draw and explain the series and parallel hybrid electric vehicles. [10M]	2	L2
15	a) Explain about speed control of induction motor. [5M] b) Write a note on motors used in traction system. [5M]	3	L2
	OR		
16	a) Explain Configuration and control of DC Motor drives. [5M] b) Write a short note on control system used in drives. [5M]	3	L2

17	a) Battery based energy storage and its analysis. [5M] b) Mention applications of batteries. [5M]	4	L2
	OR		
18	a) Discuss Different types of batteries used in hybrid electric vehicles.5M b) Write the applications of batteries. [5M]	4	L2
19	Write a short note on [10M] a. Energy stored in capacitor. b. Energy system in electric vehicles c. Energy storage with batteries	5	L2
	OR		
20	classification of different energy management strategies and explain them. [10M]	5	L2