Regulation 18 *Subject code:* 2E7BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, April 2024

HYBRID ELECTRIC VEHICLES

(EEE)

Maximum Marks: 70 Date:25.04.2024 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)

1 Define Hybrid Electric Vehicles.
2 What are Electric Vehicles?
3 Define Electric Traction.
4 Write about multi drive systems?
5 Write about PMMC Motor?
6 Define Voltage Source Inverter.
7 Define Lithium battery.
8 What is the Principle of Super Capacitor?
9 Write about Energy Management system?
10 Define Control Area Network.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Brief explain in details about components of internal combustion engines. [10]

OR

12 a. Draw the diagram of conventional system with transmission energy system. [5]
b. Write the basic performance characteristic of conventional system. [5]

13 Explain Social and environmental importance of hybrid and electric vehicles. [10]

OR

14 Explain about various hybrid drive-train topologies. [10]

15 a. Explain about speed control of induction motor. [5]
b. Write a note on motors used in traction system. [5]

OR

16 What are the components used in hybrid electric vehicles and explain them? [10]

17 Write a short note on fuel efficiency analysis in hybrid electric drive-trains. [10]

OR

18 Brief explain about Requirements for Energy Storage in Hybrid and Electric Vehicles. [10]

19 Brief explain the energy management system with different diagrams. [10]

OR

20 Explain classification of different energy management strategies. [10]