R20 Regulation *Subject code:3E7BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

HYBRID ELECTRIC VEHICLES

(EEE)

Maximum Marks: 70 Date: 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.
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)		Marks	CO	BTL
1	What is Conventional Gasoline Vehicle?	2M	1	L1
2	What is Electric Vehicles	2M	1	L1
3	Define Power Flow in Hybrid Electric vehicle	2M	2	L1
4	What is Electric Drive Train?	2M	2	L1
5	What are types of Motors used in Hybrid Electric Vehicles?	2M	3	L1
6	Write the Switch Reluctance Motor Principle	2M	3	L1
7	Define Energy Storages System	2M	4	L1
8	What is the Principle of Super Capacitor?	2M	4	L1
9	Write the Definition of Energy Management Strategies?	2M	5	L1
10	Define CAN (Control Area Network)	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
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) Explain the energy produced by internal combustion engine in vehicles b) Draw the power flow diagram of conventional system	5M 5M	1	L2
13	Explain Social and environmental importance of hybrid and electric vehicles	10M	2	L2
	OR			
14	Explain the breaking systems used in electric traction system	10M	2	L2
15	Discuss various electric drive train topologies	10M	3	L2
	OR			
16	What are the components used in hybrid electric vehicles and explain them	10M	3	L2
17	What is Energy Storage and write different types of energy storage systems used in electrical vehicles	10M	4	L2

	OR			
18	Explain the super capacitor based energy storage and also state its limitations	10M	4	L2
19	Brief explain the energy management system with different diagrams .	10M	5	L2
	OR			
20	classification of different energy management strategies and explain them	10M	5	L2