

SE(ELEC) Sem-4 G-Scheme May 2026

21/05/2026

Marks: 100

Time: 3 hours

Note:

- Question No.1 is compulsory.
- Solve ANY THREE questions from the remaining questions.
- Figure to the right indicates full marks.

Q.1	Attempt any 4 questions	Marks
A	Give the importance of ultracapacitors in EV/ HEV	5
B	Compare different energy sources used in EV.	5
C	Differentiate between series and parallel architecture of HEV.	5
D	Explain the general block diagram of Electric vehicle.	5
E	Describe the concept of "Hybridness" and classify the HEV based on hybridness.	5
Q.2		Marks
A	Illustrate the historical background of EV / HEVs technology in brief. Also describe the current scenario of EV technology along with technology challenges associated it.	10
B	Describe in detail all modes of operation of a series hybrid Electric vehicle.	10
Q.3		Marks
A	List down the different types of motors used in EHEV. Explain the parameter of the AC and DC motors used in EV/HEV	10
B	Explain why hybridization of energy sources is important for EV/HEV.	10
Q.4		Marks
A	What is the different battery charging modalities adopted for EV? Explain each one in brief and elaborate on standards adopted for the same worldwide.	10
B	Classify Energy Management Strategies in EHEV. Give the importance of each.	10
Q.5		Marks
A	Explain the different forces acting on vehicle movement.	10
B	Draw and Explain Parallel drive architecture? Also draw and explain the power flow stages used in the drive.	10
Q.6		Marks
A	State and explain Vehicle to Grid and Grid to vehicle operation in electric vehicle technology.	10
B	Explain fuel cell and flywheel as energy source element in electrical and hybrid electric vehicle.	10

11820