Name: Enrolment No:	

UPES

End Semester Examination, May 2025

Course: An Introduction to Electric Vehicle & Battery Technologies

Semester: VIII

Program: B.Tech. – ADE **Time : 03 hrs.**

Course Code: MEAD 4025 **Max. Marks: 100**

Instructions: All the questions are to be attempted. However, Internal choices are mentioned.

SECTION A
(5Q x 4M = 20Marks)

S. No.		Marks	CO
Q 1	Highlight the hazards of IC engine-based automobiles as compared to EVs	**4**	CO1
Q 2	Illustrate the series & parallel Hybrid Electric Vehicles.	**4**	CO1
Q 3	Elucidate the characteristics of Li-ion batteries	**4**	CO1
Q 4	Describe the following for a battery : i) Depth of Discharge ii) Nominal Capacity	**4**	CO2
Q 5	Illustrate the factors to be considered for sizing the drive in HEV.	**4**	CO2
	SECTION B **(4Q x 10M = 40 Marks)**		
Q 6	Classify the various Fuel Cell Technologies used in HEV / EV.	**10**	CO1
Q 7	Illustrate the advantages of Electric braking over Mechanical braking in a Hybrid Electric Vehicle.	**10**	CO2
Q 8	Compare the suitability of various DC & AC Motors for driving an Electric Vehicle	**10**	CO3
Q 9	Discuss the various aspects of Learning based and Deep Reinforced Energy Management Strategies OR Justify the statement “Battery Management System is crucial for Li-ion battery packs.”	**10**	CO3
	SECTION-C **(2Q x 20M = 40 Marks)**		
Q 10	Elaborate on the design factors to be considered for a smart Battery Management System of a typical electric car.	**20**	CO5
Q11	Compare the Rule-Based Energy management Strategies with Optimization-based Energy Management strategies. OR Compare the Strategy update in three generations of Toyota Prius Hybrid Vehicles. Highlight the needs and Improvements	**20**	CO4