Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course : M.Tech. (Advanced Vehicles) **Semester: II**
Program : Vehicle Hybridization and Electric Vehicle **Time : 03 hrs.**
Course Code: MEAV7007 **Max. Marks: 100**
Instructions: Draw figures and diagrams, wherever required.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Write and describe Electric drive-train topologies used in EV.	4	CO2
Q 2	Differentiate between IC engine vehicle, HEV and BEV.	4	CO1
Q 3	How Sizing the drive system of a Hybrid Electric Vehicle done?	4	CO1
Q 4	Write down the Impact of modern drive-trains on vehicle power supplies.	4	CO2
Q 5	Explain selection criteria's used in motor sizing.	4	CO3
	SECTION B **(4Qx10M= 40 Marks)**		
Q 1	Explain Design Principle of parallel (Mechanically Coupled) HEDT.	10	CO4
Q 2	Discuss Automatic Transmission, and explain its working?	10	CO2
Q 3	What are the different Energy Management Strategies (EMS) used in electric vehicles, write the classification of different EMS?	10	CO1
Q 4	What is Hybrid Electric Drive-trains? Describe Fuel Efficiency Analysis Steps. **OR** Explain BMS working and explain rule based control and optimization based control.	10	CO3
	SECTION-C **(2Qx20M=40 Marks)**		
Q 1	Explain Fuel Cell, Super Capacitor and Flywheel energy storage system with suitable diagram. Which one you feel can be a game changer and why?	20	CO4
Q 2	What is Electric Drive Trains (EDT), how it is different from conventional IC engine vehicles? Write advantages and limitation of EDT over IC Engine. Explain concept of electric traction used in EV. **OR** What do you understand by Motor Drives trains used for HEV? Explain Architectures of hybrid electric drive trains used in Series, Parallel and Series-Parallel HEV.	20	CO3