Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

SECOND SEMESTER M.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, MAY 2024

ALTERNATE ENERGY SOURCES FOR VEHICLES [AAE 5304]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 11 MAY 2024** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

Q.NO	Questions	Marks	CO	BTL
1A.	Explain 10 characterizing fuel properties that are essential in fuels used in vehicles.	(5)	CO1	2
1B.	Why are alternative fuels gaining momentum in today's world?	(2)	CO1	3
1C.	Briefly discuss the sources of natural gas.	(3)	CO2	2
2A.	With a neat schematic discuss different steps involved in the processing of natural gas.	(4)	CO2	2
2B.	What is dual fuel injection mode?. Discuss the major parts involved in conversion kits used in diesel engines for duel fuel purposes.	(4)	CO2	2
2C.	What are the major constituents of LPG?. State and comment on CO2 emission if LPG is used instead of petrol?	(2)	CO3	2
3A.	With a neat schematic discuss different steps involved in the processing of LPG.	(4)	CO3	2
3B.	With a neat schematic diagram discuss vapor phase injection used in the case of LPG fuel.	(4)	CO3	2
3C.	Explain the advantages of bio-diesel blends with diesel.	(2)	CO4	2
4A.	Explain different stages in the transesterification process.	(4)	CO4	2
4B.	With a neat diagram explain PEM fuel cells with different chemical reactions at the anode and cathode.	(4)	CO4	2
4C.	Discuss on properties of hydrogen as vehicle fuel.	(2)	CO4	3
5A.	Discuss how light alcohol fuels like ethanol, methanol, and dimethyl ether play a major role in realizing alternative fuels for vehicles.	(4)	CO5	3

5B.	With a schematic diagram explain the working principle of electric vehicles.	***(4)***	***CO5***	***2***
5C.	State the differences between primary and secondary batteries.	***(2)***	***CO5***	***2***