Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

ME5EL42 Alternative Fuels & Technology

Programme: M. Tech. Branch/Specialisation: AU

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated.Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The molecular weight of CNG is- **1**
(a) 6 (b) 16 (c) 26 (d) 36

ii. The formula of LPG is- **1**
(a) C_3H_8 (b) C_4H_{12} (c) C_2H_6 (d) CO_2

iii. In E85, the percentage of gasoline is- **1**
(a) 10% (b) 85% (c) 15% (d) None of these

iv. The stoichiometric air fuel ratio for ethanol is- **1**
(a) 9 (b) 19 (c) 29 (d) 39

v. Jatropha is a very good source for the production of- **1**
(a) Biogas (b) Methanol (c) Bio Diesel (d) LPG

vi. Which factor is crucial in selecting proper biogas generation site? **1**
(a) Location near waste source (b) Ample open space
(c) Proper sunlight (d) All of these

vii. What does MHD stands for in the energy field? **1**
(a) Magneto Hydro Dynamic (b) Metal Hydrogen Drive
(c) Micro Hybrid Drive (d) None of these

viii. When the source of light is not sun light then the photo voltaic cell is used as _____. **1**
(a) Photo diode (b) Photo voltaic cell
(c) Photo detector (d) Photo transmitter

ix. A fuel cell is used to convert chemical energy into- **1**
(a) Mechanical energy (b) Solar energy
(c) Electrical energy (d) Potential energy

x. The electrolytic solution used in a hydrogen-oxygen fuel cell is- **1**
(a) 75% KOH solution (b) 25% KOH solution
(c) 75% NaOH solution (d) 25% NaOH solution

P.T.O.

Q.2 i. List down the disadvantages of LPG as fuel. **2**

ii. Explain the fuel induction techniques in SI engines needed to use hydrogen as fuel. **8**

OR iii. Explain the storage, piping, dispensing, advantages and disadvantages of CNG as fuel. **8**

Q.3 i. Write a short note on automobiles using methanol as fuel. **3**

ii. Explain the production of methanol by dry milling process. **7**

OR iii. Explain the role of butanol as fuel, listing its hazards, advantages and storage system. **7**

Q.4 i. What properties of SVOs make them suitable as a fuel? **3**

ii. Explain in detail the phases of combustion when bio-diesel is used as fuel in an automobile. **7**

OR iii. Explain the construction and working of Floating type Biogas Digester (KVIC) plant. **7**

Q.5 i. Comment on the cost effectiveness of solar cell when used as energy source for automobiles. **2**

ii. Explain in detail the distribution systems employed in harnessing solar energy when using photovoltaic cells as a source of energy for automobiles. Support your answering with diagrams. **8**

OR iii. Explain the construction and working of thermoelectric generators. Support your answering with diagrams. **8**

Q.6 i. Define fuel cell. **2**

ii. Explain the use of fuel cells in the storage for heating and cooling systems. **8**

OR iii. Write short notes on: **8**
(a) Fuel cell performance characteristics
(b) Fuel reforming by fuel cells.

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No. of Questions: 6 *Total No. of Printed Pages:2*

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Knowledge is Power

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SCHEME OF MARKING

Q.1	i.	b) 16	1
	ii.	a) C_3H_8	1
	iii.	c) 15%	1
	iv.	a) 9	1
	v.	c) Bio Diesel	1
	vi.	d) all of the above	1
	vii.	a) Magneto Hydro Dynamic	1
	viii.	c) Photo detector	1
	ix.	c) Electrical energy	1
	x.	b) 25% KOH solution	1
Q.2	i.	Disadvantages points	2
	ii.	Four techniques (2 marks each)	8
OR	iii.	Storage Piping Dispensing Advantages Disadvantages	2 2 2 1 1
Q.3	i.	Short note	3
	ii.	Steps of production	7
OR	iii.	Note Hazards Advantages	2 1 2
		Storage system	2
Q.4	i.	Properties	3
	ii.	Two distinct phases (3.5 each)	7
OR	iii.	Construction Working	4 3
Q.5	i.	Comment	2
	ii.	Diagram Theory	2 6
OR	iii.	Diagram Theory	2 6
Q.6	i.	Definition	2
	ii.	Theory	8
OR	iii.	Short note 4 marks each	8

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