

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3160207

Date:25-11-2024

Subject Name:Alternative Fuels and Power Systems

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Give the classifications of alternative fuels. **03**
(b) Justify the need of alternative fuels in India. **04**
(c) Explain bio diesel production process with suitable diagram. **07**
- Q.2** (a) List the advantages & disadvantages of CNG as an alternative fuel. **03**
(b) State positive and negative consequences of electric vehicles. **04**
(c) Explain storage, emission, cost and safety criteria for LPG and CNG. **07**
- OR**
- (c) Discuss construction and working of electric vehicle with neat sketch. **07**
- Q.3** (a) Explain different components of CNG gas conversion kit in brief. **03**
(b) What is the drawback of using pure alcohol as fuel in vehicle. **04**
(c) Write a short note on free piston engine. **07**
- OR**
- Q.3** (a) Describe dual fuel engine. **03**
(b) Explain the production process of ethanol with reaction process. **04**
(c) Write a short note on solar powered vehicle. **07**
- Q.4** (a) Explain different electric motors used for automotive applications. **03**
(b) Describe stratified charge engine. **04**
(c) Explain construction and working of Wankel engine with neat sketch. **07**
- OR**
- Q.4** (a) Distinguish between viscosity and volatility. **03**
(b) Discuss the scope of availability of fossil fuel in future. **04**
(c) Write a short note on Esterification. **07**
- Q.5** (a) Compare fuel cell with battery. **03**
(b) Define effect of vegetable oil on engine emission characteristics. **04**
(c) Compare series type and parallel type hybrid electric vehicle with suitable diagrams. **07**
- OR**
- Q.5** (a) Define Fuel cell. List down the types of fuel cell. **03**
(b) Describe working of Stirling engine. **04**
(c) List down types of biogas plants. Explain anyone with diagram. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3160207****Date:05-12-2023****Subject Name: Alternative Fuels and Power Systems****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Classify different alternative fuels.	03
(b) Discuss different reasons for requirements of alternative fuels in current scenario in India.	04
(c) Explain biodiesel production process with diagram.	07
Q.2 (a) Discuss advantages and disadvantages of methanol.	03
(b) Enlist advantages and disadvantages of biodiesel.	04
(c) Write a short note on different types of biogas plants.	07
OR	
(c) Explain working of Wankel engine with neat sketch.	07
Q.3 (a) Explain different biogas production process stages.	03
(b) Explain storage and dispensing systems of CNG.	04
(c) Write a short note on electric vehicles.	07
OR	
Q.3 (a) Explain methanol production process with suitable reactions.	03
(b) Discuss different factors affecting transesterification process.	04
(c) Enlist different hydrogen production methods. Explain any two methods.	07
Q.4 (a) Discuss advantages and disadvantages of electric vehicles.	03
(b) Explain major components of Biogas Plants in detail.	04
(c) Explain parts of CNG gas conversion kit used in a vehicle.	07
OR	
Q.4 (a) Write a short note on eco friendly plastic fuel.	03
(b) Discuss advantages and disadvantages of hydrogen fuel.	04
(c) Explain Stirling engine with suitable diagrams.	07
Q.5 (a) Discuss different barriers for implementing use of alternative fuels in India.	03
(b) Discuss advantages & disadvantages of using LPG as an alternative fuel.	04
(c) Explain working of a solar powered vehicle with schematic layout.	07
OR	
Q.5 (a) Compare fuel cell with battery.	03
(b) Write a short note on fuel cell.	04
(c) Explain series & parallel type hybrid electric vehicles with neat schematic diagrams.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160207****Date:14-12-2022****Subject Name:Alternative Fuels and Power Systems****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain the properties flash point and viscosity.	03
	(b) State positive and negative consequences of electric vehicles.	04
	(c) Draw layout of solar powered vehicle and explain it.	07
Q.2	(a) What are ecofriendly plastic fuels?	03
	(b) Explain methanol production process with suitable reactions.	04
	(c) What is the drawback of using pure alcohol as fuel in vehicle.	07
OR		
	(c) Write a short note on biodiesel production process.	07
Q.3	(a) Explain safety criteria for LPG and CNG	03
	(b) Enlist factors affecting biogas formation.	04
	(c) Describe properties & production process of CNG as an engine fuel.	07
OR		
Q.3	(a) Explain different components of CNG gas conversion kit in brief.	03
	(b) Describe dual fuel engine.	04
	(c) Explain major components of Biogas Plants in detail.	07
Q.4	(a) Explain different electric motors used for automotive applications.	03
	(b) Explain working of hybrid vehicles.	04
	(c) Explain production process and storage of hydrogen.	07
OR		
Q.4	(a) What is a fuel cell? Explain its power rating and performance.	03
	(b) Write short note on Esterification.	04
	(c) What is emulsification of alcohol with diesel? Describe emission improvement by blending of alcohol with diesel.	07
Q.5	(a) Explain working of Wankel engine with neat sketch.	03
	(b) Describe stratified charge engine.	04
	(c) Compare series type and parallel type hybrid electric vehicle with suitable diagrams.	07
OR		
Q.5	(a) Is it possible to use Di- Methyl Ether (DME) as alternative fuel in I.C. engine? Explain in detail.	03
	(b) Define effect of vegetable oil on engine emission characteristics.	04
	(c) Short note on free piston engine with necessary diagrams.	07
