

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V EXAMINATION – WINTER 2025

Subject Code:3150507

Date:17-11-2025

Subject Name: Energy Technology

Time: 10:30 AM TO 01:00 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 term: energy security.	03
(b) List the application of solar energy.	04
(c) Explain in detail the Molten Carbonate Fuel Cell (MCFC) with neat diagram.	07
Q.2 (a) How to measure solar radiation?	03
(b) Why do energy sectors need reforms?	04
(c) Discuss the types, selection and application of Refractories.	07
OR	
(c) Discuss in detail the handling and preparation of fuels.	07
Q.3 (a) List site selection criteria for the wind turbine installation.	03
(b) Explain the energy future of the world.	04
(c) Discuss in detail the floating holder biogas plants.	07
OR	
Q.3 (a) Explain the applications of wind energy.	03
(b) Explain the need for energy conservation.	04
(c) Discuss the methods used to maintain the biogas production.	07
Q.4 (a) Which criteria have to be considered while designing of biogas digester?	03
(b) Discuss the application of fuel cell technologies.	04
(c) What is waste heat recovery? List advantages and applications of waste heat recovery.	07
OR	
Q.4 (a) Which points need to be considered while selecting site for biogas plants?	03
(b) List the advantages and disadvantages of fuel cell technology.	04
(c) Explain the flash steam recovery system. And also list other energy-saving potential for steam systems.	07
Q.5 (a) List the type of electrode used in the fuel cell.	03
(b) Explain solar ponds.	04
(c) Discuss the basic components of wind energy conservation system.	07
OR	
Q.5 (a) Explain the conversion efficiency of fuel cell energy.	03
(b) Explain the chemical storage system for solar energy.	04
(c) Classify and explain the wind energy conservation system.	07

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3150507

Date:25-11-2024

Subject Name:Energy Technology

Time:10:30 AM TO 01:00 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) Define energy security. Why is it important for a growing economy?	03
	(b) Differentiate between primary and secondary energy resources.	04
	(c) Explain the process of gasification of coal with a neat sketch. Discuss its advantages in energy conversion.	07
Q.2	(a) What is the significance of calorific value in fuel?	03
	(b) Explain the proximate analysis of coal and its importance in fuel selection.	04
	(c) Discuss the steps involved in identifying energy-saving opportunities in steam distribution systems.	07
	OR	
	(c) Explain the principle of combustion and describe the factors that affect the combustion efficiency.	07
Q.3	(a) Mention two methods of solar energy storage.	03
	(b) Compare flat plate collectors and concentrating collectors used in solar energy systems.	04
	(c) Describe the design and working principle of a community biogas plant. Highlight its advantages and limitations.	07
	OR	
Q.3	(a) List two properties of fuel oil important for combustion.	03
	(b) Explain the different types of solar energy collectors used for industrial applications.	04
	(c) Describe the wind energy conversion system (WECS) and discuss the basic components involved in it.	07
Q.4	(a) What is the role of a steam trap in a steam system?	03
	(b) Discuss the classification of waste heat recovery devices and their commercial applications.	04
	(c) Describe the working of a hydrogen-oxygen fuel cell with a neat diagram. Discuss its advantages and disadvantages.	07
	OR	
Q.4	(a) Define polarization in fuel cells. Why is it significant in evaluating fuel cell performance?	03
	(b) Discuss the various factors affecting the design of a biogas plant.	04
	(c) Explain the basic principles of wind energy and how site selection affects the efficiency of wind power generation.	07

- Q.5** (a) What are the factors affecting the efficiency of thermal gasification of biomass? **03**
(b) Define energy audit and explain its importance in industries. **04**
(c) Discuss the impact of energy consumption on the environment and how energy conservation helps mitigate these impacts. **07**

OR

- Q.5** (a) Write a short note on the future of renewable energy sources. **03**
(b) Explain the concept of economic thickness of insulation and its relevance in energy conservation. **04**
(c) Describe the different types of electrodes used in fuel cells and their roles in improving conversion efficiency. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023****Subject Code:3150507****Date:05-12-2023****Subject Name: Energy Technology****Time: 10:30 AM TO 01:00 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) Name two reasons why steam is used as a heat transfer medium.	03
	(b) Give an example of Energy savings by reducing the work done by steam.	04
	(c) Describe Pyrolysis system with neat figure.	07
Q.2	(a) What is energy efficiency? Discuss with any one example.	03
	(b) Differentiate between proximate and ultimate analysis.	04
	(c) Derive the formula for calculating maximum torque and maximum axial thrust.	07
	OR	
	(c) Explain photosynthesis process and also write necessary conditions for it.	07
Q.3	(a) Write down three reasons to control the rotor speed.	03
	(b) Explain different types of electrodes in brief.	04
	(c) Describe any one type of the solar refrigeration system.	07
	OR	
Q.3	(a) Name two functions of a steam trap.	03
	(b) Differentiate between hydrogen- oxygen fuel cell and fossil fuel cell.	04
	(c) Formulate and derive the Betz coefficient. Show each step and write your assumptions clearly.	07
Q.4	(a) Discuss classification of WECS.	03
	(b) Draw the flow sheet of the community biogas plant.	04
	(c) Discuss advantages and disadvantages of fuel cell.	07
	OR	
Q.4	(a) Explain why low-pressure steam is more efficient?	03
	(b) Discuss classification of solar energy storage in detail.	04
	(c) Describe any one type of the solar water heating system.	07
Q.5	(a) List out desired properties of an ideal ion exchange membrane electrolyte.	03
	(b) What are the precautions to be taken while steam pressure is reduced for a process?	04
	(c) Explain the correlation between energy and environment in detail.	07
	OR	
Q.5	(a) Write a short note on world energy future.	03
	(b) Define energy audit and write its importance.	04
	(c) Write a short note on conversion efficiency & polarization.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2022****Subject Code:3150507****Date:04-01-2023****Subject Name:Energy Technology****Time:10:30 AM TO 01:00 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) Give your thoughts about energy consumption and world energy future	03
	(b) Differentiate : Conventional and Non-conventional energy, primary and secondary energy resources	04
	(c) Describe flat plate solar collector with neat sketch	07
Q.2	(a) Define terms : Energy security and Energy audit	03
	(b) Discuss about commercially viable waste heat recovery devices	04
	(c) Explain application and advantages of various solar collectors	07
	OR	
	(c) Short Note : Solar pond	07
Q.3	(a) Define terms: Proximate analysis, ultimate analysis and calorific value	03
	(b) Discuss about Insulation types and its application	04
	(c) Explain about solar energy storage system	07
	OR	
Q.3	(a) State various types of fuel cells.	03
	(b) Advantages and disadvantages of fuel cell.	04
	(c) Give applications of fuel cell with explanation.	07
Q.4	(a) What are the factors affecting biogas generation?	03
	(b) Describe about energy conservation along with its importance.	04
	(c) Short note : Types of biogas plant	07
	OR	
Q.4	(a) Define pyrolysis and explain	03
	(b) List out the main considerations for site selection of wind energy?	04
	(c) Give applications of wind energy	07
Q.5	(a) Define: (i) Beam Radiation, (ii) Solar Altitude, (iii) Solar Azimuth Angle	03
	(b) List out applications of solar energy.	04
	(c) Describe construction and working of KVIC digester	07
	OR	
Q.5	(a) Define Photosynthesis. What are the conditions necessary for photosynthesis?	03
	(b) State various types of instruments for measuring solar radiation? Explain any one.	04
	(c) Describe Molten Carbonate Fuel Cell (MCFC) with neat diagram.	07
