

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3161914****Date:29-05-2026****Subject Name: Renewable Energy Engineering****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) Classify solar thermal collectors.	03
	(b) Define following terms:	04
	1. Irradiation	
	2. Insolation	
	3. Radiosity	
	4. Emissive Power	
	(c) Classify the various non-conventional energy sources and their availability with reference to Indian context. List the direct and indirect application of solar Energy.	07
Q.2	(a) Give equations of Angle of incident, declination, surface azimuth, slop angle of latitude and hour angle.	03
	(b) Calculate the number of daylight hours in Ahmedabad on 8-June 1995, (latitude 23°2'N, Longitude 72°4'E)	04
	(c) Explain Photovoltaic (PV) Power generating system.	07
	OR	
	(c) Write short note on Solar distillation with neat sketch.	07
Q.3	(a) Write components of wind mills with neat sketch.	03
	(b) What are the design consideration of horizontal axis machines?	04
	(c) Discuss force on blade and torque on wind mill.	07
	OR	
Q.3	(a) What is wind energy? Give its applications.	03
	(b) Explain following terms:	04
	a. Wind turbine	
	b. Wind electric generator	
	c. Pitch control	
	d. Yaw control	
	(c) What are the basic components of WECS (Wind Energy Conversion System)? Classify WECS.	07
Q.4	(a) What are the main characteristics and uses of biomass?	03
	(b) Comparison between open and closed cycle OTEC system.	04
	(c) Explain Hydro gasification, types of gasifiers and process of gasification.	07
	OR	
Q.4	(a) What is Biomass? How are bio-gas plants classified?	03
	(b) Explain factors affecting the production of biogas.	04

- (c) Derive equation for power and energy in single basin tidal system. 07
- Q.5** (a) Explain annual saving, cumulative saving and life cycle saving. 03
(b) Give Advantages and disadvantages of geothermal energy sources. 04
(c) Explain the working principle of MHD generator with different components of MHD system. 07
- OR**
- Q.5** (a) Explain repayment of loan in equal annual investment. 03
(b) Give benefits of CDM (Clean Development Mechanism). 04
(c) Derive the equation for the maximum power output of MHD generator. 07
