

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3161914****Date:08/06/2022****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) Explain reserves, production and utilization of primary	03
	(b) How can renewable energy benefit the environment?	04
	(c) List instruments used for measurement of solar radiation intensity. Explain any one with neat sketch.	07
Q.2	(a) Define terms : Declination, Solar constant, Angle of Incidence	03
	(b) Describe solar dryer in detail.	04
	(c) Define solar constant. Also explain spectrum distribution of terrestrial and extraterrestrial radiation at sea level with graph.	07
OR		
	(c) The latitude of Srinagar is 34° . Find day length in hours when sunlight is available on 1 st July.	07
Q.3	(a) Explain basic operational principles of solar cell.	03
	(b) Explain the different heat losses in Flat plate Collector	04
	(c) Prove that the maximum turbine output can be achieved when $V_e = V_i/3$, Where V_i and V_e are upstream and downstream velocities of the wind.	07
OR		
Q.3	(a) Explain solidity, tip speed ratio and power co-efficient for wind mill	03
	(b) Explain upward draft gasifier with diagram.	04
	(c) Discuss problems in operating large wind power generation.	07
Q.4	(a) List factors affecting production of biogas	03
	(b) What is anaerobic digestion? Explain with neat sketch the three stage scheme for methane fermentation.	04
	(c) Describe the working of floating drum type KVIC biogas plant with the help of neat sketch	07
OR		
Q.4	(a) Explain principle of MHD generation	03
	(b) List the geothermal resources. Explain binary fluid hydrothermal system.	04

- (c) Explain with sketches the various methods of tidal power generation. What are the limitations of each method? **07**
- Q.5** (a) Draw neat sketches of Open and Closed cycle OTEC systems. **03**
- (b) Explain with neat sketch the vapour dominated geothermal system **04**
- (c) Explain return of investment (ROI)? Write down its limitation **07**
- OR**
- Q.5** (a) What do you understand by spring and neap tides? How are they caused? **03**
- (b) Explain method of simple payback period. What are its limitations? **04**
- (c) With usual notations derive an expression for cumulative savings. **07**
