

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VIII (New) EXAMINATION – WINTER 2019****Subject Code: 2181910****Date: 27/11/2019****Subject Name: Renewable Energy Engineering****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.

		MARKS
Q.1*	(a) What is solar cell? State its working principle.	03
	(b) What is the importance of renewable energy sources?	04
	(c) What is solar pond? Explain solar pond with schematic diagram.	07
Q.2	(a) Define (1) solar altitude angle (2) solar zenith angle (3) solar azimuth angle.	03
	(b) What is anerobic digestion? Explain three phases of it in brief.	04
	(c) Explain construction and working of pyranometer with neat sketch.	07
	OR	
	(c) Write short note on solar dryer.	07
Q.3	(a) State advantages of wind energy.	03
	(b) Explain concept of solar constant and air mass	04
	(c) State the principle of Ocean Thermal Energy Conversion (OTEC). Describe the working of closed cycle OTEC system with schematic diagram.	07
	OR	
Q.3	(a) Explain three forms of biomass.	03
	(b) Give at least four common problems in biogas plants, their causes and its remedies.	04
	(c) Calculate the local solar time and declination at a location latitude $23^{\circ}15'N$, Longitude $77^{\circ}30' E$ at 12:30 IST on June 19, 2010. Equation of time correct is given as $1^{\circ}010''$.	07
Q.4	(a) Explain direct, diffuse and total radiation.	03
	(b) Explain return of investment (ROI)? Write down its limitation.	04
	(c) Explain liquid dominated geothermal power plant with neat sketch.	07
	OR	
Q.4	(a) Explain solidity, tip speed ratio and power co-efficient for wind mill.	03
	(b) Give comparison between flat plate liquid collector and flat plate air collector.	04
	(c) Discuss problems in operating large wind power generation.	07
Q.5	(a) State working principle and components of MHD generator.	03
	(b) Explain basic principle of wind energy conversion.	04
	(c) Describe the working of floating drum type KVIC biogas plant with the help of neat sketch.	07
	OR	
Q.5	(a) Define (1) time value of money (2) Net present value (3) Future value.	03
	(b) What is simple payback period? How it helpful to investor?	04
	(c) Write in detail about solar electro-chemical power plant.	07
