

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- I & II (SPFU) EXAMINATION – WINTER 2019****Subject Code: TEE010****Date: 13/01/2020****Subject Name: Renewable Energy****Time: 10:30 AM TO 01:30 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) Describe the essentiality for exploration of renewable sources of energy.	03
	(b) What are the different types of solar cell?	04
	(c) Define the following terms with necessary sketch. 1. Solar declination angle 2.Hour angle 3.Solar Zenith angle 4.Solar incident angle.	07
Q.2	(a) What is the difference between an active and passive solar heating system?	03
	(b) Explain construction and working Pyrheliometer with diagram.	04
	(c) Calculate the sun's altitude and azimuth angles at 9 a.m., solar time on Sept. 1 at latitude 23° N	07
	OR	
	(c) Calculate the declination angle for March 31 in a leap year.	07
Q.3	(a) State the expression for hour angle and day length.	03
	(b) Explain the construction and principle of operation of a sunshine recorder.	04
	(c) How the solar water heating systems are classified? Explain the working of thermo-syphon solar water heating system with the help of a neat sketch.	07
	OR	
Q.3	(a) What is basic principle of ocean thermal energy conversion.	03
	(b) Enlist types of solar thermal power plants. Discuss working of solar pond electrical power plant with help of neat sketch.	04
	(c) Derive the expression for power developed due to wind.	07
Q.4	(a) Explain the working of double basin tidal system.	03
	(b) Compare the fixed dome type plant and movable drum type plant.	04
	(c) Calculate the open circuit voltage and maximum power output of MHD engine with following specifications. Plant area=0.2 sq.m, Distance between plates=0.4m. Flux density=2 wb/sq.m, Average gas velocity =1000m/sec Conductivity of gas=10 mho/m.	07
	OR	
Q.4	(a) What is energy crisis and energy demand?	03
	(b) Describe biochemical conversion of biomass into liquid and gaseous fuels.	04
	(c) Tidal power plant of single basin type has a basin area of 25×10^6 sq.m.The tide has a range of 10 m. The turbine however, stops operating when the head on it falls below 2m.calculate the energy generated in on filling process in kwh if the turbine generator efficiency is 75%(take sea water density=1025 kg/cu.m	07

- Q.5 (a) What do you mean by dry steam, wet steam and hot water geothermal systems? **03**
- (b) Explain power in ocean wave. Enlist the various wave energy converters? Write advantages and disadvantages of wave energy. **04**
- (c) Write short notes on : KVIC Biogas plant. **07**
- OR**
- Q.5 (a) Describe the main considerations for selection of site for a Biogas Plant. **03**
- (b) Describe the advantages and disadvantages of Geothermal Energy sources. **04**
- (c) Write brief note on Performance Characteristic of Wind machine. **07**

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