Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI• EXAMINATION–SUMMER 2015

Subject code: 161904 **Date:14/05/2015**

Subject Name: Alternate Energy Sources

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.**

Q.1	**(a)**	What are the conventional and non conventional energy sources ? Describe briefly.	**07**
	(b)	Which instruments are used for solar radiation measurements. Explain construction and working of Pyranometer.	**07**
Q.2	**(a)**	Classify different types of solar collectors and explain the construction details of a flat plate collector with neat sketch.	**07**
	(b)	Define the following: 1. Solar constant 2. Air mass 3. Extraterrestrial radiation 4. Terrestrial radiation 5. Beam radiation 6. Diffused radiation 7. Global radiation	**07**
		OR	
	(b)	Determine the number of day light hours in Shrinagar on 5th January and 5th July. Latitude : 36 degree 05 Minutes.	**07**
Q.3	**(a)**	Describe the main consideration in selecting the site for wind energy conversion system.	**07**
	(b)	A propeller type horizontal shaft wind turbine has diameter of 90 meter and operating speed is 50 r.p.m at its maximum efficiency. Wind at 1 bar and 25ºC has a velocity of 12 m/s. Calculate : 1. Total power density in the wind stream 2. Maximum obtainable power density 3. Reasonable obtainable power density assuming η=38% 4. Total power produced 5. Torque and axial thrust produced at maximum efficiency	**07**
		OR	
Q.3	**(a)**	How solar water heating are classified ? Explain working of Thermo Syphon water heating system with neat sketch.	**07**
	(b)	What is the Solar Still ? Explain with neat sketch.	**07**
Q.4	**(a)**	How are Bio gas plants are classified ? Explain continuous and batch type plants	**07**
	(b)	Discuss the factors which affect the bio gas production in detail.	**07**
		OR	
Q.4	**(a)**	Enlist the advantages of geothermal energy. Explain liquid dominated geothermal plant.	**07**

	(b)	State the different types of geothermal energy resources. Explain the hot dry rock geothermal resources and their utilization.	**07**
Q.5	**(a)**	Describe the construction and working of OTEC system based on closed cycle with the help of schematic diagram.	**07**
	(b)	Explain with sketches the various methods of tidal power generation. What are the limitation of each methods ?	**07**

OR

Q.5	**(a)**	State MHD principle. Explain open MHD with neat diagram.	**07**
	(b)	State the methods of waste heat utilization and explain any one	**07**

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