Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV • EXAMINATION – SUMMER 2015

Subject Code:141904 **Date: 08/06/2015**

Subject Name: Non-Conventional Energy Sources

Time:10.30am-01.00pm **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)**	Explain four advantages and three disadvantages of Non-Conventional Energy Sources.	**07**
	(b)	Define Solar Constant. State the value of Solar Constant. Describe the terms (1) Beam radiation (2) Diffuse radiation (3) Global radiation.	**07**
Q.2	**(a)**	State the seven factors to be considered for site selection for wind farm.	**07**
	(b)	The wind is blowing at the rate of 10 m/s having the atmosphere at 1 bar, 300 K. This wind is harnessed by a wind turbine having its efficiency of 42%. Find the total power and the actual power per square meter of rotor area which can be developed by the turbine. Assume R=287 N-m/kg K.	**07**
		OR	
	(b)	Draw the neat sketch of Solar Flat plate liquid collector. State the function of each component.	**07**
Q.3	**(a)**	Classify windmills. Draw the neat sketch of Horizontal Axis Wind Turbine Generator. State the function of each component.	**07**
	(b)	Classify energy conversion process from Biomass. Describe different Biochemical conversion process.	**07**
		OR	
Q.3	**(a)**	Explain the working of any one Liquid Dominated Geothermal Power Plant with neat sketch.	**07**
	(b)	Describe construction and working of Double basin tidal power plant with neat sketch.	**07**
Q.4	**(a)**	Define (1) Declination angle (2) Solar altitude angle (3) Zenith angle (4) Solar azimuth angle (5) Surface azimuth angle (6) Angle of Incidence (7) Day length	**07**
	(b)	Describe the working of Closed cycle Ocean Thermal Electric Conversion (OTEC) system. State two advantage and disadvantages of it.	**07**
		OR	
Q.4	**(a)**	Classify different types of biogas plant with an example. Explain construction and working of Janta model Biogas plant with neat sketch.	**07**
	(b)	Explain the working of Magneto Hydro Dynamic (MHD) Power Generation. State the different fuel and materials used in MHD generator.	**07**
Q.5	**(a)**	Draw the neat sketch of Domestic Solar cooker. Explain its construction and working.	**07**
	(b)	Describe the Principle of operation of fuel cells with neat sketch.	**07**
		OR	
Q.5	**(a)**	State different type of energy audit. Explain them in brief.	**07**
	(b)	Explain Electrolysis method of Hydrogen production in details.	**07**

****