Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B E Sem-VI Examination May 2011

Subject code: 161904

Subject Name: Alternate Energy Sources

Date:21/05/2011 **Time: 10.30 am – 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)**	Derive an equation for maximum power, maximum torque and maximum axial thrust available from wind turbine. What is optimum velocity ?	**07**
	(b)	Write name of solar radiation measuring instruments. Explain sun shine recorder with figure.	**07**
Q.2	**(a)**	Write short note on Darrius rotor.	**07**
	(b)	Write a brief note on effect of various parameters on performance of flat plate collectors.	**07**
		OR	
	(b)	Enlist types of solar thermal power plants. Discuss working of solar pond electrical power plant with help of neat sketch.	**07**
Q.3	**(a)**	What are the conventional and non-conventional energy sources? Describe briefly.	**07**
	(b)	What is basic principle of ocean thermal energy conversion.	**07**
		OR	
Q.3	**(a)**	Describe the construction and working of OTEC system based on closed cycle with help of schematic diagram.	**07**
	(b)	How are bio-gas plants classified? Explain continuous and batch type plants.	**07**
Q.4	**(a)**	What are liquid dominated hydrothermal resources? How these can be utilized in a high temperature wet steam system?	**07**
	(b)	Describe an MHD open cycle system. What are the main advantages of an MHD power generation?	**07**
		OR	
Q.4	**(a)**	What are co-generation plants? Discuss the gas turbine co-generation systems with help of neat sketches. What are their advantages?	**07**
	(b)	Define the following terms with necessary figure. (1)Solar Altitude Angle (2) Solar Zenith angle (3)Solar Azimuth Angle (4)Declination Angle (5)Latitude Angle (6)Hour Angle	**07**
Q.5	**(a)**	Discuss the various factors. Which can affect in energy saving in a compressed air system.	**07**
	(b)	Discuss the factors which affect the biogas production in detail.	**07**
		OR	
Q.5	**(a)**	Explain with sketchs the various methods of tidal power generation. What are the limitations of each method?	**07**
	(b)	Describe the layout and working of a continuous solar cooling system.	**07**

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