Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 713907N **Date: 30-12-2013**

Subject Name: Renewable Energy System

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)**	Define following terms. (1) Zenith angle (2) Declination angle (3) Hour Angle (4) Latitude angle (5) Solar constant (6) Beam radiation (7) Lift & Drag forces	**07**
	(b)	What is biomass? What are the different sources used to extract biomass energy?	**07**
Q.2	**(a)**	Explain the factors affecting the performance of solar collectors.	**07**
	(b)	Explain construction of parabolic solar cooker with neat sketch. List the advantage of parabolic cooker with box type solar cooker.	**07**
		OR	
	(b)	List the various methods of using solar energy. Distinguish between Photo thermal, Photovoltaic & Photosynthesis methods.	**07**
Q.3	**(a)**	Explain wind power conversion system with neat sketch.	**07**
	(b)	Define power coefficient of a horizontal axis wind turbine and prove that its maximum value is (16/27) when the wind flows parallel to the axis of turbine..	**07**
		OR	
Q.3	**(a)**	Explain working & construction of Darrieus wind mill with neat sketch.	**07**
	(b)	List the various parameters for selecting the site for wind power plant. List the advantages of wind energy over solar energy.	**07**
Q.4	**(a)**	Explain Downdraft gasifier with neat sketch.	**07**
	(b)	Explain the thermo-chemical biomass conversion process.	**07**
		OR	
Q.4	**(a)**	Distinguish between float and fixed dome type of biomass plant.	**07**
	(b)	Explain Construction & working of Janta biogas plant with neat sketch.	**07**
Q.5	**(a)**	Explain the working of vapour dominated geothermal system with neat sketch.	**07**
	(b)	List the resource of geothermal energy for power generation. Explain Hot dry rock system.	**07**
		OR	
Q.5	**(a)**	Describe the factors affecting for design a digester.	**07**
	(b)	List the application & advantages of solar driers.	**07**

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