Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem - IV Examination May- 2011

Subject code: 742101

Subject Name: Non Conventional Energy Conversion Systems

Date:16/05/2011 **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)**	Explain advantages and disadvantages and applications of solar cells.	**07**
	(b)	Give advantages and disadvantages of concentrating collectors over flat plate collector.	**07**
Q.2	**(a)**	Define collection efficiency of a flat plate collector. What are the parameters on which it depends?	**07**
	(b)	Explain selection of materials for flat plate collectors.	**07**
		OR	
	(b)	Write short note on solar radiation measurement.	**07**
Q.3	**(a)**	Determine the intercept factor and concentration ratio (CR) for a parabolic cylinder concentrator which produces an image in the focal plane with h = 60 for ratios of width of receiver to width of concentrator as 0.01 and 0.04, assuming receiver is symmetrical with respect to the centre of the focus.	**07**
	(b)	Explain thermal performance and design considerations for focusing collectors.	**07**
		OR	
Q.3	**(a)**	Explain factors affecting biomass generation.	**07**
	(b)	Give classification of biogas plants and explain any one of them with neat sketch.	**07**
Q.4	**(a)**	Explain advantages and limitations of various wind energy conversion systems.	**07**
	(b)	Explain principle of Magneto-hydrodynamic power generation.	**07**
		OR	
Q.4	**(a)**	Explain analysis of thermoelectric materials and their selection.	**07**
	(b)	Write short note on recent trends in direct energy conversion systems.	**07**
Q.5	**(a)**	Determine the collector overall loss coefficient using Klein's empirical relation, for a single glass cover with the following data: Plate to cover spacing=2.5 cm, Plate emissivity =0.95, Ambient temperature = 10^{o}C, Wind speed = 5.0 m/s, Back insulation thickness = 5 cm, Insulation conductivity = 0.045 W / m^2 ^{o}C, Mean plate temperature = 65 ^{o}C, Collector tilt = 23 ^{o}. Neglect edge losses.	**07**
	(b)	Write short note on hydrogen as alternative fuel for vehicles.	**07**
		OR	
Q.5	**(a)**	Explain photovoltaic principle. Describe a basic photovoltaic system for power generation.	**07**
	(b)	List various production methods of hydrogen and explain any one of them.	**07**

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