

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-IV Examination June- 2010****Subject code: 141904****Subject Name: Non Conventional Energy Sources****Date : 21 / 06 / 2010****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)** What is meant by renewable energy sources? Explain in brief these energy resources with special reference to Indian context. **07**
- (b)** Explain with neat sketch Abbot Silver disc Pyrheliometer. **07**
- Q.2 (a)** What is the principle of solar photo voltaic power generation? What are the main elements of a PV System? **07**
- (b)** Describe with neat sketch the construction and working of the solar pond. **07**
- OR**
- (b)** Calculate the local solar time and declination at a location latitude $23^{\circ}15'N$, Longitude $77^{\circ}30'E$ at 12:30 IST on June 19, 2010. Equation of time correction is given from standard table or chart is - 1' 01". **07**
- Q.3 (a)** Prove that for a horizontal axis propeller type wind mill. **07**
 $P_{max} = 0.595 P_{total}$.
- (b)** The wind is blowing at the rate of 10m/s having the atmospheric condition at 1 bar, 300 k. the wind is harnessed by a wind turbine having its efficiency of 42%. Find the total power and actual power per square meter of rotor area, which can be developed by the turbine. Assume $R = 287 \text{ N.m/Kg.K}$ **07**
- OR**
- Q.3 (a)** Describe with neat sketch the construction and working of the fixed dome type biogas plant. **07**
- (b)** (i) What is the difference between biomass and biogas? **07**
(ii) Explain the process - "Photosynthesis". What are the conditions, which are necessary for it?
- Q.4 (a)** What are the advantages and disadvantages of Geothermal energy forms? **07**
- (b)** Describe a Binary cycle system for liquid dominated system. **07**
- OR**
- Q.4 (a)** Describe closed cycle OTEC system with advantages over open cycle system. **07**
- (b)** Write short note on : Tidal power plant with double basin system. **07**
- Q.5 (a)** What is MHD? What are the various types of it? Explain any one of them. **07**
- (b)** Explain about Phosphoric Acid Fuel Cells (PAFC) **07**
- OR**
- Q.5 (a)** Discuss on : Hydrogen as an alternative fuel for motor vehicles. **07**
- (b)** What are the co-generation plants? Explain the difference between bottoming and topping cycles **07**
