

Seat No.: _____

Enrolment No. _____

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 $-1^{\circ}01''$. **07**

Q.3 (a) Prove that for a horizontal axis propeller type wind mill. **07**

$$P_{\max} = 0.595 P_{\text{total}}$$

(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**
