

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Semester-IV- Examination June- 2011****Subject code: 141904****Subject Name: Non Conventional Energy Sources****Date:13/06/2011****Time : 10:30 am to 1:00 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) Classify the various non-conventional energy sources and their availability with reference to Indian context. **07**

(b) What are the applications of geothermal energy? **07**

Q.2 (a) Discuss performance analysis of a solar cell. **07**

(b) Explain the working of solar cell power plant with neat sketch. **07**

OR

(b) Discuss the environmental effects of geothermal energy sources. **07**

Q.3 (a) Explain with neat sketch various sun-earth angles. **07**

(b) Calculate number of daylight hours at Delhi on Dec 21st and June 21st in year 2012. **07**

OR

Q.3 (a) Calculate sun's altitude and azimuth angles at 9 A.M solar time on September 1 at latitude 23 degree N. **07**

(b) Write applications of SPV systems. **07**

Q.4 (a) Explain working of molten carbonate fuel cell (MCFC) AND Direct methanol fuel cell (DMFC). **07**

(b) Discuss various factors for site selection to establish wind power plant. **07**

OR

Q.4 (a) Discuss briefly the types of Bio-gas plants. **07**

(b) Explain the principle of open cycle OTEC system with suitable diagram. **07**

Q.5 (a) Calculate the open circuit voltage and maximum power output of MHD engine with following specifications. **07**

Plant area=0.2 sq.m, Distance between plates=0.4m.

Flux density=2 wb/sq.m, Average gas velocity =1000m/sec

Conductivity of gas=10 mho/m.

(b) Discuss with neat sketch power duration and velocity duration characteristics of a wind. **07**

OR

Q.5 (a) Tidal power plant of single basin type has a basin area of 25×10^6 sq.m. The tide has a range of 10 m. The turbine however, stops operating when the head on it falls below 2m. calculate the energy generated in on filling process in kwh if the turbine generator efficiency is 75%(take sea water density=1025 kg/cu.m) **07**

(b) Write short notes (1) working and performance analysis of a fuel cell. **07**
(2) Magnus effect.
