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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(EE) (2013 Batch E-I) (Sem.–2)

RENEWABLE ENERGY RESOURCES

Subject Code : MTEE-204C

Paper ID : [A2507]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries EQUAL marks.

1. a) What are the two basic types of instruments employed for the measurement of solar radiation? Give an example of each and describe them with neat diagram. (14)

   b) List the advantage and limitation of OTEC plants. (6)

2. a) List the difference between renewable and non-renewable energy sources. (10)

   b) What are selection criteria for optimum wind energy generator (WEG)? (10)

3. a) Explain the construction and working of tidal power plant. (10)

   b) Explain the principle of operation of Fuel Cell. Explain the types and applications of fuel cells. (5+5)

4. Discuss the resources, techniques of estimation and conversion systems of geothermal power. (20)

5. a) What are the prospects of renewable energy sources in India? Mention the advantage of renewable energy sources. (12)

   b) What are operating characteristic of fuel cell? (8)

6. a) Write a short note on impact of renewable energy generation on environment. (8)

   b) Define the following with respect to solor radiation geometry :

      i) Declination (3)

      ii) Hour angle (3)

      iii) Local Solar time (3)

      iv) Solar Constant (3)

7. a) Explain the working of open cycle OTEC system for ocean thermal energy. (10)

b) A single basin type tidal power plant has a basin area of 3 km^2. The tide has an average range of 10 m, power is generated during flood cycle only. The turbine stops operating when the head on it falls below 3m. Calculate the average power generated by the plant in a single filling process of the basin, if the generator - turbine efficiency is 0.65. Estimate the average energy generation of the plant. Density of sea water may be assumed as 1025 kg/m^3. (10)

8. With neat sketches, discuss **any of two** the following : (10 × 2 = 20)

a) Solor furnace

b) Hybrid electric vehicles

c) Solor photovoltaic system