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BIMEE-003

DIPLOMA IN MECHANICAL ENGINEERING (DMEVI)

00354

Term-End Examination

June, 2014

BIMEE-003 : NON-CONVENTIONAL ENERGY RESOURCES

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any five** questions.*

(ii) Attempt suitably any missing data.

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1. (a) Define solar constant (I_{sc}), Insulation and Declination (δ). **4**

   (b) Calculate the no. of daylight hours at Delhi on December 21 and June 21 in a leap year. **10**

2. (a) With the help of a neat sketch explain the working of concentrating type solar collector. **10**

   (b) Explain the application of flat plate collector in space heating. **4**

3. Explain in detail power duration and velocity duration characteristics of wind and define cutin and furling speed. **14**

4. (a) Enlist different factors which affect the generation of Biogas. **7**

   (b) Explain the working of fixed Dome type Biogas plant. **7**

5. Prove the following for a single Basin system 14

$\frac{P_{av}}{A} = 0.225R^2$ where, symbols have their usual meaning.

6. A tidal power plant of single basin type, has a basin area of $25 \times 10^6 m^2$. The tide has a range of 10 m. The turbine, however, slops operating when the head on it falls below 2 m. Calculate the energy generated in kWh, in one filling process if the turbine generator efficiency is 75% (Density of sea water = 1025 kg/m^2). 14

7. (a) Explain working of vapour Dominated Geothermal power plant. 7

(b) Explain the various criteria used in the selection of the site for wind energy conversion system. 7