Code No: **R41027**          **R10**          Set No. 1

### IV B.Tech I Semester Supplementary Examinations, February/March - 2018
### NON CONVENTIONAL SOURCES OF ENERGY
### (Open Elective)

**Time: 3 hours**                                          **Max. Marks: 75**

### Answer any FIVE Questions
### All Questions carry equal marks
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1  a)  Explain the terms angle of latitude, Declination angle and Hour angle With respect to solar radiation. [8]
   b)  Calculate the number of day light hours in Srinagar for 1 January and 1 July. Take latitude of Srinagar as $34^0$ 05' North. [7]

2      Derive the expression for the angle of incidence for an inclined surface? Find the angle of incidence when (i) tilt angle = $0^o$ (ii) tilt angle = $90^0$ (iii) Surface azimuth angle = $0^0$. [15]

3  a)  Explain the necessity of Solar energy storage and how it is useful in present energy scenario [8]
   b)  Explain the process of Solar distillation along with its usage. [7]

4  a)  Explain the basic principle of wind energy conversion. [7]
   b)  Derive the expression for power developed due to wind. [8]

5  a)  Explain Aerobic and Anaerobic Processes. [8]
   b)  What are the factors considered while locating a biogas plant? [7]

6  a)  Enumerate the merits and demerits of geothermal energy. [7]
   b)  List the environmental problems caused by geothermal energy. [4]
   c)  List the geothermal resources potential in India? [4]

7  a)  Explain the merits and demerits of OTEC (Ocean Thermal Energy conversion) Plant. [8]
   b)  Explain the different modes of operation of a tidal power plant. [7]

8      Write Short notes on the following:
       a) Carnot Cycle
       b) Mini – hydel Power plants
       c) Fuel cells and its operating conditions [15]