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

IV B.Tech I Semester Supplementary Examinations, March/April - 2016

NON–CONVENTIONAL SOURCES OF ENERGY

(Open Elective Except for Electrical and Electronics Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Explain the effect of irradiance on the horizontal surface and tilted surface. [8]

b) How the solar radiation data is collected and how it is helpful in solar energy conversion? [7]

2 a) Explain various factors affecting the performance of flat plate collector. [8]

b) Discuss the orientation of flat plate collector to get the maximum output with suitable diagrams. [7]

3 a) What is solar still? Draw its diagram and explain the working in detail. [8]

b) Enumerate different applications of solar energy. Describe a natural circulation solar water heating system. [7]

4 a) The wind is blowing at the rate of 10 m/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 N.m/Kg [8]

b) Discuss the wind characteristics, performance and limitations of energy conversion systems. [7]

5 a) What are the merits and limitations of biomass as energy sources? What are the constraints on the availability of biomass feed stocks for energy application? [10]

b) Explain why the bio gas digester effluent is superior to the composite fertilizer. [5]

6 a) Why does water in geothermal aquifers remain in the liquid state even though its temperature may be more than 100^0C? [8]

b) What are the difficulties in the large scale utilization of geothermal energy? [7]

7 a) With reference to neat layout diagrams, explain the operation of a closed cycle OTEC plant. [8]

b) What are the economic benefits of setting mini-hydel power plants? [7]

8 a) What are the parameters which govern the power output of an MHD generation? Explain them in brief? [8]

b) What is MHD? What are the various types of it? Explain any one of them? [7]