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14MTP/MTH151

**First Semester M.Tech. Degree Examination, Dec.2014/Jan.2015**  
**Non-Conventional Energy System**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1 a. What are tar sands? With a schematic diagram explain the production of crude oil from tar sands. (08 Marks)  
b. Explain the need for alternative sources of energy. (06 Marks)  
c. Mention the advantages and disadvantages of non – exhaustible sources of energy. (06 Marks)
- 2 a. With scheriatic representation, explain the mechanism of solar radiation absorpction and scattering. (06 Marks)  
b. With a neat sketch, explain the working of pyranometer for measuring global radiation. (08 Marks)  
c. With a schematic diagram, explain the basic photovoltaic system for power generation. (06 Marks)
- 3 a. Mention the applications of solar energy. (04 Marks)  
b. With a neat schematic diagram, explain a forced circulation solar water heater. (08 Marks)  
c. With a sketch, explain solar distillation. Also mention its advantages and disadvantages. (08 Marks)
- 4 a. Explain the terms : i) pyrolysis ii) liquefaction iii) gasification. (09 Marks)  
b. Mention the factors affecting biodigestion. (07 Marks)  
c. Mention any four differences between fixed dome type plant and floating drum plant. (04 Marks)
- 5 a. With a neat sketch, explain the basic components of a wind energy conversion system. (10 Marks)  
b. How are ocean waves caused? Mention advantages and disadvantages of wave energy. (10 Marks)
- 6 a. Explain the need for a mini hydropower plant in a larger energy framework. (08 Marks)  
b. With schematic diagrams, explain any two types of turbines used for small scale electric power generation. (12 Marks)
- 7 a. Explain various geothermal energy sources. (08 Marks)  
b. Mention the advantages and disadvantages of geothermal energy. (06 Marks)  
c. With a schematic diagram, explain closed OTEC cycle. (06 Marks)
- 8 a. Derive an expression to estimate the energy and power in simple single basin tidal system. (08 Marks)  
b. Mention the advantages and disadvantages and limitations of a tidal energy system. (06 Marks)  
c. What is meant by nuclear fusion? Discuss the requirements of nuclear fusion. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

