(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199851 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2013-14

NON CONVENTIONAL ENERGY RESOURCES

Time : 3 Hours *Total Marks : 100*

Note: (i) Attempt all questions.

(ii) All questions carry equal marks.

(iii) Be precise in your answer.

1. Attempt any **four** parts of the following **(5×4=20)**

(a) Discuss the primary and secondary energy sources. Also describe the future of non-conventional energy sources in India.

(b) Explain why direct energy conversion processes are becoming more important as compared to conventional generation.

(c) What is demand side management ? How it is useful in energy conversion ?

(d) Describe the difference between the Direct radiation and Diffuse radiation.

(e) How can solar energy be converted into electrical energy. Give a diagram showing the elements of such a plant.

2. Attempt any **two** parts of the following **(10×2=20)**

(a) Explain the principle of conversion of solar energy into heat. Explain a flat plate solar collector.

(b) What is meant by solar pond ? Explain. Describe the working of solar power plant.

(c) Explain Thermal Energy storage for solar heating and cooling. What are limitations of solar plants ?

(d) Explain sensible heat storage, latent heat storage and thermochemical storage of solar energy.

3. Attempt any **two** parts of the following: **(10×2=20)**

(a) Describe the various types of identified geo-thermal energy resources and mention its application at different temperatures.

(b) Describe a geothermal field from which geothermal steam is obtained through hot springs. What are the prospects of geothermal energy in context to India ?

(c) Explain the working principle of MHD generator. Also, discuss the practical problems associated with MHD power generation.

(d) What is a fuel cell ? Describe the principle of working of a H_2O_2 cell. Give also limitations.

4. Attempt any **two** parts of the following **(10×2=20)**

(a) Describe the working of a Thermo-electric generator. Derive an expression for its power output.

(b) What do you understand by thermionicemission effect ? Derive the expression for power and efficiency of a thermionic generator.

(c) What do you understand by the nature of wind ? Describe with the help of of a neat sketch the construction and working of a Wind Energy Conversion System (WECS).

(d) What methods are used to overcome the fluctuating power generation of a windmill ? Discuss their merits and demerits.

5. Attempt any **two** parts of the following **(10×2=20)**

(a) Describe the factors that affect the size of a biomass plant. Describe the materials used for bio-gas generation.

(b) How does biomass conversion take place ? Name the various models of biogas plant and describe any one of them.

(c) Describe the basic principle of ocean thermal energy conversion system. Describe the "Open Cycle" Ocean thermal energy conversion system.

(d) Explain the principle of operation of a simple single effect tidal power plant and give a graph of sequential operating modes.