

(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 thermionic emission 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 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.