

[Total No. of Questions - 8] [Total No. of Printed Pages - 2]  
(2125)

15417

**M. Tech 3rd Semester Examination**  
**Non Conventional Energy System**  
**EE1-632(c)**

**Time : 3 Hours**

**Max. Marks : 100**

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt any five questions and all questions carry equal marks. Assume missing data if any suitably. Use of non-programmable calculator is allowed.

1. (a) Explain the various non conventional energy sources and state their advantages over conventional energy sources. (10)  
(b) Explain briefly the global energy scenario in 21st century. (10)
2. (a) Explain the solar constant. Differentiate between extraterrestrial and terrestrial solar radiations. (6)  
(b) A flat plate collector has two glass covers each 3 mm thick, having refractive index of 1.526 and an extinction coefficient of 0.0161/mm. Calculate the transmittance taking into account the absorption and reflection for normal incidence. (10)  
(c) Explain the principle of PV effect in crystalline silicon. (4)
3. (a) Explain the general passive solar heating techniques. (10)

[P.T.O.]

2

15417

- (b) Explain the features of a large grid connected solar PV plant. (10)
4. (a) Explain the status of wind power potential in India. (10)  
(b) Explain the various types of wind turbines with the help of diagrams. (10)
5. (a) Explain the various power conditioning components used and their functions in wind power grid connection. (10)  
(b) Draw and explain the typical power versus wind speed characteristics of variable speed wind machines. (10)
6. (a) Derive an expression for the power output and efficiency of an MHD power generator. (10)  
(b) Briefly explain the open cycle MHD power generation systems and closed cycle MHD power generation systems. (10)
7. (a) Explain any one type of fusion reactor and explain the main problems in harnessing fusion energy. (10)  
(b) Explain the principle of operation and construction of a basic thermionic generator. (10)
8. (a) State the classification of fuel cells. (5)  
(b) State the working principle of induction generators. (5)  
(c) State the uncertainties in wind resource assessment. (5)  
(d) State Peltier effect and its applications. (5)