Register Number: ……

M.E. DEGREE EXAMINATIONS: JANUARY 2011

First Semester

ENERGY ENGINEERING

EEG502: Solar Energy Systems

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions: -

PART A (10 x 2 = 20 Marks)

1. Define ‘Photosphere’
2. What is direct radiation?
3. What are important details to be included in solar radiation data?
4. What is Irradiance?
5. What is meant by a solar collector?
6. What are the advantages of flat plate collectors?
7. Define ‘Concentration ratio’
8. What are the most critical properties of a concentrating collector?
9. List out few materials used for latent heat storage.
10. What is a solar cell?

PART B (5 x 16 = 80 Marks)

11. (a) (i) Give brief description about various types of Renewable Energy Sources (10)

(ii) What are the advantages of Renewable Energy Sources? (6)

(OR)

(b) (i) Explain Solar Declination ,Elevation and Zenith angles. (8)

(ii) Describe Solar radiation at a tilted surface. (8)

12. (a) Explain the schematic arrangement and working principle of Pyranometer with neat sketch.

(OR)

(b) (i) Explain the radiation characteristics of Opaque materials. (10)

(ii) What are transparent materials? Explain. (6)

13. (a) (i) Explain a typical solar water heater setup with neat sketches. (12)

(ii) List down the factors to be considered during design of flat plate collector. (4)

(OR)

(b) Describe the basic principle and working of solar air drier.

14. (a) Explain the working of Compound Parabolic Concentrator with neat sketches. What are the advantages?

(OR)

(b) (i) Describe the method of power generation using Central Receiver Power Station. (10)

(ii) Explain the principle of operation of Cylindrical concentrating collectors. (6)

15. (a) (i) Explain solar thermal energy storage system. (10)

(ii) What is meant by solar passive architecture? Explain. (6)

(OR)

(b) What are the basic components of Solar heating system? Explain.

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