

M.E. DEGREE EXAMINATIONS: NOVEMBER 2009

Third Semester

ENERGY ENGINEERING

P07ENE11 Solar Energy Systems

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. Give the advantages of solar energy over other renewable energy sources?
2. What are the devices used for measuring solar radiation?
3. Explain diffuse radiation?
4. Define instantaneous collection efficiency.
5. What is acceptance angle?
6. Define collector aperture area.
7. Name the different types of concentrating collectors.
8. What are the advantages of concentrating collectors over flat plate collectors?
9. Explain transmissivity and absorptivity of a solar collector.
10. Give few applications of solar energy.

PART B (5 x 16 = 80 Marks)

11. (a) (i) Explain the structure of the sun. (6)
(ii) Explain the empirical equations for predicting the availability of global solar radiation. (10)
(OR)
(b) Explain about solar radiation outside and at the earth's surface. (16)
12. (a) Explain the construction and working of a typical Pyranometer. (16)
(OR)
(b) Explain about abbot silver disc Pyrheliometer with neat sketch. (16)
- 13 (a) (i) Derive the expression for efficiency of a flat plate collector. (10)
(ii) What are the limitations of flat plate collectors? (6)
(OR)
(b) Explain the air heating flat plate collectors with its types. (16)

14 (a) Explain the construction and working of cylindrical parabolic collector. (16)

(OR)

(b) Explain about the materials used for different components of solar concentrators. (16)

15. (a) (i) Briefly explain about solar desalination. (10)

(ii) Explain solar passive cooling of buildings. (6)

(OR)

(b) Explain about a solar photovoltaic water pumping system (16)
