

B.E. Sixth Semester (Mechanical Engineering) (CGS)
10859 : Elective - I : Non-Conventional Energy System : 6 FEME 05

P. Pages : 2

Time : Three Hours



AU - 2745

Max. Marks : 80

- Notes :
1. Due credit will be given to neatness and adequate dimensions.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

1. a) Describe the main features renewable energy sources and explain the importance of non-conventional energy sources in the context of global warming. 6
- b) Describe Abbot Silver Disc pyrheliometer with neat sketch for measurement of beam radiation. 7

OR

2. a) Define :- 8
 - i) Declination
 - ii) Hour Angle
 - iii) Altitude Angle
 - iv) Slope.
 - b) Calculate Angle made by beam Radiation with the normal to flat plate. Collector, pointing due south located in New Delhi ($28^{\circ} 38' N$, $77^{\circ} 17' E$) at 9:00 Hrs solar time on 17 March the collector is tilted at angle of 35° with the horizontal. 5
3. a) How solar Air collector are classified? What are the main application of drier. 5
 - b) Discuss the effect of following on the performance of LFPC. 8
 - 1) Selective surface.
 - 2) No. of glass cover.
 - 3) spacing between Absorber plate & cover.
 - 4) Dust on top cover.

OR

4. a) Enumerate the different types of concentrating collector. Describe briefly. 7
 - b) Explain the terms :- 6
 - 1) Aperture
 - 2) Optical Efficiency.
 - 3) Concentration Ratio.
 - 4) Acceptance Angle.
5. a) Explain the desirable properties of latent heat storage materials. 5
 - b) Explain the following application of solar energy with its neat sketch. 9
 - i) Low temperature rankine cycle for power generation.
 - ii) Space heating system using solar air heaters.
 - iii) forced circulation dryer.

OR

6. a) Explain the following application of solar energy with neat sketch. 9
i) Solar furnace.
ii) Double slope solar still.
iii) Solar vapour compression refrigeration system.
b) Discuss the Desirable properties of sensible heat storage materials. 5

SECTION – B

7. a) Describe with neat diagram, open cycle OTEC power plant. 7
b) What are the principle motions significant for the operation of wind mill. 7

OR

8. a) Draw and discuss close cycle OTEC power plant. 6
b) Explain various types of wind mills with simple sketches. 8
9. a) What do you mean by SEP? On which factors the cost of energy obtain from SEP depends. 5
b) Explain the effects of following on Biogas production rate. 8
i) pH value ii) Temperature
iii) C-N Ratio iv) digester Diameter to Depth ratio.

OR

10. a) Explain KVIC type biogas plant with neat sketch. What are the main differences between KVIC and Chinese biogas plant? 8
b) Explain the mechanism of green plant photosynthesis. 6
11. a) Explain total flow concept of Geothermal Energy with neat sketch. 6
b) What are the various types of solar cell? How the efficiency of solar cell is determined? 7

OR

12. a) How fuel cell works? State it advantages and disadvantages. 6
b) Explain flash steam liquid dominated geothermal system with neat figure. 7

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