Register Number: ……

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Seventh Semester

MECHATRONICS ENGINEERING

U07MHE11: Renewable Sources of Energy

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

Answer ALL Questions:-

PART A (10 x 1=10 Marks)

1. The CO_2 emission from developed countries accounts for _____% of total green house gas emission of the word.

   A. 10% B. 20% C. 30% D.80%

2. Normal concentration of CO_2 in the atmosphere is _____%

   A. 0.003% B. 0.03% C. 0.3% D.3%

3. Solar concentration ratio is

   A. Ratio of the area of aperture of the system to the area of the receiver

   B. Ratio of the energy incident on the collector to the area of aperture of the system

   C. Energy actually absorbed by the collector to the energy incident on the collector

   D. None of the above

4. ---------- is the angle between the Sun's ray incident on the plane surface (Collector) and the normal to that surface

   A. Inclination angle B Solar azimuth angle C.Angle of incidence D.Tilt angle

5. When the axis of rotation is parallel to the air stream, the turbine is said to be a

   A. Horizontal axis wind turbine B. Vertical axis wind turbine

   C. Multi axis wind turbine D. None of the above

6. Boiling point of the hydrogen

   A.- 104 C B.- 313 C C. - 20 C D.- 253 C

7. For electric power generation minimum average wind speed required is

   A. 1 m/s B. 2 m/s C. 5 m/s D. 3m/s

8. A minimum temperature difference of --------- is required for practical energy conversion between the warm surface ocean water and the colder deep water

   A. 70C B. 20 C C. 50 C D. 10 C

9. The Conversion efficiency of the Solar cell is the ratio of

A. Incident solar power to cost of the solar cell

B Electric power output to the incident solar power

C. Electric power output to the cost of the solar cell

D. cost of the solar cell to the Electric power output

10. Basic principle behind the thermo electric power generator is

A. Hall effect B Raman effect C. Seebeck effect D. Nernst effect

PART B (10 x 2 = 20 Marks)

11. List out the three important aspects of energy conservation.
12. Write the merits and demerits of non conventional energy sources.
13. What is solar pond?
14. What is solar furnace?
15. What are the advantages and disadvantages of wind energy system?
16. Write the working principle of ocean thermal energy conversion.
17. Name any three biomass conversion technologies.
18. What is magneto hydrodynamic power generator (MHD)?
19. Draw a block diagram of ethanol production from biomass.
20. What is fuel cell?

PART C (5 x 14 = 70 Marks)

21. (a) Explain the various pollutants with their harmful effects.

(OR)

(b) Describe the various non -conventional energy sources.

22. (a) Explain the working of low temperature solar power plant with neat diagram.

(OR)

(b) Explain the following with neat diagrams.

(i) Solar air heater (7)

(ii) Solar pump (7)

23. (a) What are the types of wind turbine? Explain the construction details of horizontal axis wind turbine.

(OR)

(b) List out various geothermal resources. Explain the vapour dominated geothermal electrical power plant with diagram.

24. (a) Explain about the biomass gasification plant with neat diagram.

(OR)

(b) (i) Discuss in detail about the factors which affect biomass production. (7)

(ii) Describe about various biomass resources. (7)

25. (a) Explain the operation of MHD (Magneto hydrodynamic power) generator with neat sketch. Also write its advantages and disadvantages.

(OR)

(b) Write short notes on the following.

(i) Classification of fuel cells and its applications. (7)

(ii) Hydrogen production and its storage. (7)

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