Register Number: ……

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Seventh Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07 EEE20: Renewable Energy Resources

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

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. The total installed capacity of power from renewable **ene**rgy sources in India is

   a) 12000Mw b) 13242Mw c) 2800Mw d) 24000Mw

2. How many joules are in 1kwh?

   a) 3.6 x 106 joules b) 2.6X106 joules c) 2.8 joules d) 4.8 joules

3. The Fill Factor is also known as

   a) reflection factor b) refractive factor c) efficiency d)short circuit factor.

4. Which type of material is most useful for solar cell work

   a) Metals b) Insulators c) Semi-conductors d) Liquid Crystals

5. At a wind speed of 10m/s and 100Kw turbine output, the rotor diameter is nearly:

   a) 64m b) 11.3m c) 22.35m d) 90m

6. A wind is blowing at a velocity v through an area at right angles to it. The density of wind is ρ. KE of wind is :

   a) ρAv^3 b) ρAv^2 c) $1/2\ \rho v^3$ d) $1/2\ \rho Av^2$

7. Tidal cycles at any location have a periodic time of :

   a) 24 hrs b) 24hr 15 min c) 6hr 12.5min d) 12hr 25min

8. The efficiency of an OTEC system is nearly:

   a) 50% b) 15% c) 5% d) 30%

9. High head hydel plants usually use

   a) Pelton turbines b) Francis Turbine c) bulb Turbine d) Kaplan Turbine

10. The force on electron $F = - qv_e X B$ is known as

    a) Faraday force b) Hall Force c) Lorentz force d) Maxwell fore.

PART B (10x2=20 Marks)

11. State the reason for energy crisis in the world?
12. What are the advantages of renewable energy sources?
13. Write the significance of Brayton cycle?
14. What are the instruments available for solar radiation measurement?
15. Write the factors which determine the output of wind energy systems?
16. What is meant by Yaw Control and Pitch Control in wind turbine?
17. What are the prospects of ocean thermal energy conversion in India.
18. Expand NIOT.
19. State the limitations of MHD generating system.
20. Define Half Life Period.

PART C (5x14=70 Marks)

21. a) Discuss in detail about world energy status – present availability and future trends.

(OR)

b) (i) What are the conclusions on alternate energy strategies. (7)

(ii) Write a note on social implications in the renewable energy sources. (7)

22. a) (i) With the help of a schematic diagram, explain the structure and working of medium temperature solar power plant. (7)

(ii) Discuss the reasons for variation in solar radiation reaching the earth received at the outside of the atmosphere. (7)

(OR)

b) (i) Draw and explain the V-I Characteristics of a solar cell. (7)

(ii) Writ a note on SPV cells fabrication. (7)

23. a) A propeller wind turbine has following data:

Speed of free wind at a height of 10m = 12m/s, Air Density = 1.226kg/m^3, $\alpha = 0.14$", height of the tower = 100m, Diameter of rotor = 80m, wind velocity at the turbine reduces by 20%, generator Efficiency = 85%. Find :

(i) Total power availability in wind

(ii) Power extracted by the turbine

(iii) Electrical power generated

(iv) Axial thrust on the turbine.

(OR)

b) With neat block diagram explain the components of wind energy conversion system. Also explain the factors influencing wind.

24. a) Describe the closed cycle OTEC system with its advantages and disadvantages.

(OR)

b) Explain the various methods of wave power generation with a conceptual diagram. What are the limitations.

25. a) (i) Explain the typical arrangement of small hydro power station. (7)

(ii) Explain the working principle of closed cycle MHD power generation system. (7)

(OR)

b) (i) Write a note on hydrogen storage system. (7)

(ii) Draw the CANDU reactor and explain its working. (7)

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