

M.E. DEGREE EXAMINATIONS: DECEMBER 2009

First Semester

POWER ELECTRONICS AND DRIVES

PED569: Renewable Energy Resources

Time: Three Hours

Maximum Marks: 100

Answer All the Questions:-

PART A (10 x 2 = 20 Marks)

1. What are the primary and secondary energy sources?
2. What are the demerits of non-conventional energy sources?
3. What are the applications of solar energy?
4. Define concentration ratio of a solar collector.
5. Write the expression for available wind power.
6. Define the term "power coefficient".
7. Draw the schematic diagram for Claude cycle ocean thermal energy conversion (OTEC) system type.
8. Write the merits of tidal power generation.
9. Write the five principle methods for hydrogen storage.
10. What are the advantages of Magneto Hydro Dynamic systems?

PART B (5 x 16 = 80 Marks)

11. a) i. What are the conventional and non-conventional energy sources? Describe briefly. (10)
ii. What are the advantages of renewable energy sources? (6)
- (OR)
- b) i. Explain environmental aspects of energy sources. (10)
ii. Explain the term "Energy status". (6)
12. a) With the help of schematic diagram explain the working of solar thermal electric power plant using distributed collectors.

(OR)

- b) i. Determine the average value of solar radiation on a horizontal surface for June 22, at the latitude of 10°N , if constants a and b are given as equal to 0.35 and 0.55 respectively and the ratio $n/N=0.6$.

[Assume $\delta=+23.5^\circ$ and $n=172$]

- ii. Write the application of solar photovoltaic system.

13. a) i. Describe horizontal axis type aero-generators.
ii. What are the advantages of vertical axis machines over horizontal type?

(OR)

- b) i. Describe the different schemes for wind electric generation.
ii. Write short notes on Darrius rotor.

14. a) i. Explain with sketches the various methods of tidal power generation.
ii. What are the difficulties in tidal power developments?

(OR)

- b) i. A deep ocean wave of amplitude 2m peak to peak appear for a period of 8sec. find the wavelength, phase velocity and power associated with the wave. At this power rate, what is the average annual wave energy in Mwh/m?

- ii. What are the main advantages and disadvantages of ocean wave energy.

15. a) What is Electrolysis? Describe the more popular method of hydrogen production.

(OR)

- b) i. Explain the principles of MHD power generation.
ii. Write short notes on materials for MHD generator.
