

Assignment I

- 1) What are the advantage and disadvantage of concentrating collectors over a flat plate collector?
- 2) Describe briefly the advantage of non-conventional energy recourses over conventional energy
- 3) write short notes on diffused, beam and total radiation
- 4) Which instrument is used in to measured solar radation.
- 5) Write short notes on :
Incident angle
Hour angel

Assignment 2

1. Explain the process of photosynthesis. What are the condition which are for it?
2. Describe the basic principle of ocean thermal energy conversion system.
3. What are the advantage and disadvantage of savonius rotor?
4. Explain Seeback, Peltier and Thompson thermoelectric energy conversion system.
5. Describe the working of a Thermo-electric generator. Derive an expression for its power output.

Assingment 3

6. Write merit and demerit of wave energy.
7. What are the advantage and disadvantage of wind power?
8. Define following-:

Yaw control

Hub

Pitch angle

Wind turbine

Darrieus rotor

9. What is geothermal energy? Write short notes on limitation of geothermal energy.
10. A typical wind generator has diameter 5 meter in a region of mean wind speed of 5 meter/sec. determine the power produce if the wind turbine is used to draw water from a well at a depth of 10m at a storage tank at 5m above the ground. Determine the discharge. Take $C_p=0.2$.

Assingment 4

- 1) Explain the working of horizontal axis 2 blade windmill
- 2) What are advantage and disadvantage of darrieus type rotor?
- 3) Define following blade element, wind velocity, incident wind velocity, tower.
- 4) Derive an equation of energy extract from the wind turbine.
- 5) How biomass conversions take place?

Assingment 5

- 1) Explain the difference between fixed dome and Floating drum type biogas plant.
- 2) Draw a Schematic diagram for solar pond based electric plant with cooling tower and explain its working?
- 3) Differentiate between extraterrestrial and terrestrial sky radiation?
- 4) Define and explain the term solar constant and solar insulation.
- 5) Discuss the difference between geothermal power plant and thermal power plant.
- 6) What do you mean by non-conventional energy resources? Discuss briefly.
- 7) Discuss the principal of solar collector. How collector coating can be used to improve the performance of collector?

8) Write short notes on :

Solar azimuth angle

Declination angle

Write short notes on :

Zenith angle

Angle of latitude



Printed Pages : 3

ME – 023

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4062

Roll No.

--	--	--	--	--	--	--	--	--	--

B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

**NON-CONVENTIONAL ENERGY RESOURCES &
UTILISATION**

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all questions.

1. Attempt any **two** of the following : **10×2 = 20**
 - (a) Discuss about Indian and global energy resources. Also describe the future of non-conventional energy resources in India.
 - (b) Briefly discuss about the energy demand in India. Write a short note of energy stored in biomass.
 - (c) Write short notes on the following :
 - (i) Magnetohydrodynamics
 - (ii) Energy-planning.

2. Answer any **two** of the following : **10×2 = 20**
 - (a) What are the main criteria of selecting site of wind mill ? What is magnus effect ?
 - (b) Write the working principle of Darriens machine. Discuss briefly, about aerobic bio-conversion process.

4. Answer any **two** of the following : $10 \times 2 = 20$

- (a) Briefly discuss thermionic emissions. What do you mean by theoretical and actual efficiency of thermionic systems ?
- (b) What do you mean by reversible cell ? Discuss about different fuel cells. How do you calculate efficiency of cells ?
- (c) Write the work function of a metal. Describe constructional details of a basic thermionic generator.

5. Answer any **four** of the following : $5 \times 4 = 20$

- (a) What are the properties of thermoelectric materials ?
- (b) What is the working principle of thermoelectric plant generators ?
- (c) Briefly discuss hot springs and steam ejectors.
- (d) What are the essential criteria of selecting site for Geothermal power plant ?
- (e) briefly discuss OTEC cycle.
- (f) A 2-m wave has a 6s period and occurs at the surface of water 100 m deep. Find the wavelength, the wave velocity, the horizontal and vertical semi-axes for water motion of the surface, and the energy and power densities of the wave. Water density = 1025 kg/m^3 .