

Seventh Semester B.E. Degree Examination, June-July 2009
Renewable Energy Source.

Max. Marks:100

Time: 3 hrs.

Note: Answer any FIVE full questions.

- 1 a. Distinguish between conventional and non-conventional sources of energy. (08 Marks)
 b. Explain the concept of "Energy consumption is a measure of prosperity". (06 Marks)
 c. Write a brief note on the prospects of Renewable Energy Sources in India. (06 Marks)

- 2 a. State and explain Solar Constant. (05 Marks)
 b. Explain Angstrom pyrheliometer with a neat diagram. (05 Marks)
 c. Determine the local solar time and declination at a location latitude $23^{\circ}15'$ North, longitude $77^{\circ}30'$ East at 12.30 IST on 19th June 2007, the time correction is (-1'01"). (10 Marks)

- 3 a. With a neat diagram explain the components of liquid heating flat plate collector. Mention the advantage of glass cover in such an application. (10 Marks)
 b. What is Solar pond? Explain its working principle with a neat sketch. (10 Marks)

- 4 a. Classify energy storage systems and describe in brief the different storage systems. (10 Marks)
 b. Describe the working principle of a solar photo voltaic cell. With the help of a neat diagram explain the working of a solar photo voltaic power system. (10 Marks)

- 5 a. Explain the working of Wind Energy Conversion system for generation of Electrical Energy, with a neat diagram. (10 Marks)
 b. Derive an expression for the available power in the wind. (05 Marks)
 c. Explain the factors that determine the location for Installation of wind electric generators. (05 Marks)

- 6 a. Explain the following as applied to biomass conversion
 i) Thermo-chemical conversion. (09 Marks)
 ii) Anaerobic digestion. (05 Marks)
 iii) Fermentation. (06 Marks)
 b. Define Biomass. Give a descriptive classification of biomass resources.
 c. Explain any three factors, which affect biodigestion.

- 7 a. Explain the three main components of tidal power plant. (10 Marks)
 b. Explain the working of single basin tidal power plant. (10 Marks)

- 8 Write short notes on any four of the following
 i) Concentrating collectors.
 ii) Solar distillation.
 iii) Advantages and disadvantages of WECS.
 iv) Photosynthesis.
 v) Advantages and Limitations of power. (20 Marks)

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Seventh Semester B.E. Degree Examination, Dec.08/Jan.09

Renewable Energy sources

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions

- 1 a. Describe briefly about the conventional and non-conventional energy sources. (10 Marks)
b. What are the prospects of non-conventional energy sources in India? Also mention the advantages and limitations of renewable energy sources. (10 Marks)
- 2 a. Define the following terms: Incident angle, Zenith angle, altitude angle, solar azimuth angle and latitude angle. (10 Marks)
b. What is the difference between a pyr heliometer and a pyranometer? Describe the principle of Angstrom type pyr heliometer. (10 Marks)
- 3 a. Enumerate the different types of concentrating type collectors. Describe a collector used in power plant for generation of electrical energy. (10 Marks)
b. Explain the various methods of solar energy storage. Describe thermal energy storage system. (10 Marks)
- 4 a. Describe with a neat sketch the working of a wind energy system with main components. (10 Marks)
b. Prove that in case of horizontal axis wind turbine max power can be obtained when:
Exit velocity = $\frac{1}{3}$ wind velocity
$$P_{\max} = \frac{8}{27} \rho A V_i^3$$
 (10 Marks)
- 5 a. How are biogas plants classified? Explain them briefly. (10 Marks)
b. Explain the constructional detail and working of KVIC digester. (10 Marks)
- 6 a. Briefly explain the factors affecting bio-digestion. (12 Marks)
b. What are the main problems related to biogas plants. (08 Marks)
- 7 a. What are the main types of OTEC power plants? Describe their working procedure in brief. (10 Marks)
b. Explain with neat sketches the various methods of tidal power generation. (10 Marks)
- 8 Write short notes on any four:
a. Solar pond.
b. Advantages and disadvantages of WECS.
c. Selection of site for a biogas plant.
d. Solar photovoltaic power generation.
e. Solar green house.
f. Basic principle of tidal power generation. (20 Marks)