



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

**PAPER ID : 199851**

Roll No.

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**B. Tech.**

**(SEM. VIII) THEORY EXAMINATION, 2014-15  
NON CONVENTIONAL ENERGY RESOURCES**

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt all questions.
  - (2) Be precise in your answer.

**1 Attempt any two parts of the following : 10×2=20**

- (a) What are conventional and non-conventional energy resources ? Discuss the prospects of non-conventional energy sources in India.
- (b) Describe the principle of solar photovoltaic energy conversion. Classify solar cells. What are the materials used in solar cells ? Also discuss the factors that limit the efficiency of the solar cells.
- (c) What is MNRE ? What are the mission and functions of it ? Define and explain renewable and non-renewable energy resources. Mention at least one energy resources in each category.



2 Attempt any two parts of the following :  $10 \times 2 = 20$

(a) Describe the various methods of solar radiation measurement. How can we measure all (direct, diffuse and global) radiations with the help of Pyranometer ?

(i) Calculate the angle of declination for 5th May of a leap year.

(ii) Calculate the hour angle at the time 8.15 p.m.

(b) With the help of a neat diagram explain the zenith angle and altitude angle in respect of solar radiation analysis.

(c) Discuss the principle of a concentrating solar collector. How it differs with flat plate collector ? How collector coating can be used to improve the performance of collector with reference to the flat plate collector ? What is the concentrating ratio for focusing collector ?

3 Attempt any four parts of the following :  $5 \times 4 = 20$

(a) What is geothermal energy ? Discuss different systems used for generating the power using geothermal energy.

(b) Give the principle of MHD power generator. Explain in detail, the closed MHD system.

(c) How many ways we can store solar energy ? Explain in brief about thermal energy storage and mechanical energy storage.

(d) What is fuel cell ? Differentiate between AFC and PEMFC.

(e) Discuss the difference between a geothermal power plant and thermal power plant. Categories, the various resources of geothermal energy.

4 Attempt any two parts of the following :  $10 \times 2 = 20$

(a) Explain the working of thermoelectric generator. Differentiate between thermoelectric and thermo-ionic conversion system.

(b) Describe with a neat sketch, the working of a WECS with main components. What are the main factors to be considered for the selection of a site for wind generators ?

(c) Briefly describe :

(i) Seeback effect

(ii) Petlier effect

5 Attempt any two parts of the following :  $10 \times 2 = 20$

- (a) Explain the basic principle of Ocean Thermal Energy Conversion (OTEC). How can tidal power be utilized for the benefits of mankind ?
- (b) What are tides ? How they are formed ? Discuss the functioning of a tidal power plant.
- (c) Describe the factors that affects the size of biogas plant and the materials used for biogas generation.