



Printed Pages : 4

TOE01

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

PAPER ID : 0901

Roll No.

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B.Tech

**(SEM VII) ODD SEMESTER THEORY EXAMINATION 2009-10
NON CONVENTIONAL ENERGY RESOURCES**

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt all questions.
 - (2) All questions carry equal marks.
 - (3) In case of numerical problem assume data wherever not provided.
 - (4) Be precise in your answer.

1 Attempt any four parts of the following : **5×4=20**

- (a) What is meant by Non-Conventional Energy Resources? Explain in brief these energy resources with reference to Indian Context.
- (b) Describe the advantages and disadvantages of the Non-conventional energy resources.
- (c) Describe the difference between the Direct radiation and Diffuse radiation.
- (d) With the help of a neat diagram explain the following in respect of solar radiation analysis :
 - (i) Solar Azimuth angle
 - (ii) Altitude angle
 - (iii) Zenith angle.



- (e) Describe the various methods of solar radiation measurement.
- (f) Explain the principle of conversion of solar energy into heat.

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

- (a) Describe the various types of identified geo-thermal energy resources and mention its application at different temperature.
- (b) Describe the characteristics of the materials used for different components of a power plant utilizing geothermal energy.
- (c) Describe the various operational and environmental problem encountered in obtaining the geothermal energy.
- (d) By the help of a neat diagram explain the construction, working and characteristics of a vapour dominated geothermal power plant.

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

- (a) What are the various losses associated with the operation of MHD ? Describe the working of a closed cycle MHD generator.
- (b) What are the important factors to be considered while selecting materials for an MHD generator? Name the materials and their characteristics for electrodes and generator duct.

- (c) Describe the various types of fuel cells. Discuss their advantages, disadvantages and limitations.
- (d) Describe the construction, working and principle of a Hydrocarbon Fuel Cell.

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

- (a) What do you understand by the nature of wind ? Describe the factors that affects the nature of wind.
- (b) Describe with the help of a neat sketch the construction and working of a WECS (Wind Energy Conversion System).
- (c) What are the advantages of vertical axis machines over horizontal type? Describe the construction of a rotor for a relatively low velocity wind.
- (d) What do you understand by seeback thermo electric effect? How does seeback coefficients vary with temperatures ?

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

- (a) How are bio-gas plants classified? Explain them briefly giving their advantages, disadvantages and limitations.
- (b) Describe the factors that affect the size of a biogas plant. Describe the materials used for bio-gas generation.

- (c) Describe the basic principle of ocean thermal energy conversion OTEC. What are the main types of OTEC power plants? Describe their working in brief.
- (d) Describe the construction and working of any one type of wave energy conversion machine.

