



**B.TECH.**

**THEORY EXAMINATION (SEM-VIII) 2016-17  
NON CONVENTIONAL ENERGY RESOURCES**

**Time : 3 Hours**

**Max. Marks : 100**

**Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.**

**SECTION – A**

- 1. Explain the following:** **10 x 2 = 20**
- State Seebeck Effect and Peltier Effect.
  - Write the chemical reaction takes place in Alkaline Fuel Cell.
  - What is an aerobic digestion?
  - Define solar constant. What is its standard value?
  - Discuss the terms Energy conservation and Energy audit.
  - What is the maximum energy conversion efficiency of a wind turbine for a given swept area?
  - Define Fill Factor.
  - On what factors does the collector efficiency of a solar flat plate collector depend?
  - What is OTEC? Discuss in brief.
  - Describe various Geothermal Energy Resources.

**SECTION – B**

- 2. Attempt any five of the following questions:** **5 x 10 = 50**
- Discuss the main features of various types of renewable and non-renewable energy sources. Also explain the importance of non-conventional energy sources in the context of global warming.
  - Classify different types of solar thermal collector and show the constructional details of a flat plate collector. What are its main advantages?
  - Explain the mechanism of photoconduction in a PV cell.
  - Explain the process of gasification of solid biomass. What is the general composition of the gas produced and what is its heating value? What are its applications?
  - Explain the 'Single Basin' and 'Two Basin' systems of tidal power harnessing. Discuss their advantages and limitations.
  - Explain the essential features of a hydrogen-oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.
  - With the help of a schematic diagram, explain the operation of closed cycle MHD generating system.
  - Explain the process of production of biogas from biomass. Describe Deen Bandhu Biogas plant.

**SECTION – C**

- Attempt any two of the following questions:** **2 x 15 = 30**
- What are the most favorable sites for installing wind turbines? Using Betz model of a wind turbine, derive the expression for power extracted from wind. Under what condition does the maximum theoretical power can be extracted from the wind turbine?
  - Write short notes on:** i) Practical problems associated with MHD power generation. ii) Solar Cell Arrays. iii) Vertical Axis Wind Mills.
  - Describe the principle of working and constructional details of basic thermionic generator. What is the basic difference between thermoelectric and thermionic conversion systems? Also, explain the working of thermoelectric generators.

