

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**

- (a) State Seebeck Effect and Peltier Effect.
- (b) Write the chemical reaction takes place in Alkaline Fuel Cell.
- (c) What is an aerobic digestion?
- (d) Define solar constant. What is its standard value?
- (e) Discuss the terms Energy conservation and Energy audit.
- (f) What is the maximum energy conversion efficiency of a wind turbine for a given swept area?
- (g) Define Fill Factor.
- (h) On what factors does the collector efficiency of a solar flat plate collector depend?
- (i) What is OTEC? Discuss in brief.
- (j) Describe various Geothermal Energy Resources.

SECTION – B**2. Attempt any five of the following questions:****5 x 10 = 50**

- (a) 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.
- (b) Classify different types of solar thermal collector and show the constructional details of a flat plate collector. What are its main advantages?
- (c) Explain the mechanism of photoconduction in a PV cell.
- (d) 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?
- (e) Explain the 'Single Basin' and 'Two Basin' systems of tidal power harnessing. Discuss their advantages and limitations.
- (f) 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.
- (g) With the help of a schematic diagram, explain the operation of closed cycle MHD generating system.
- (h) 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**

- 3. 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?
- 4. **Write short notes on:** i) Practical problems associated with MHD power generation. ii) Solar Cell Arrays. iii) Vertical Axis Wind Mills.
- 5. 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.