

Paper Id **900153**

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**B. TECH.**  
**(SEM-8) THEORY EXAMINATION 2018-19**  
**NON CONVENTIONAL ENERGY RESOURCES**

*Time: 3 Hours**Total Marks: 100***Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief.** **2 x 10 = 20**
- a. Discuss Energy conservation and Energy audit.
  - b. What is surface azimuth angle?
  - c. State seebeck Effect and peltier Effect.
  - d. Write the chemical reaction takes place in Alkaline Fuel Cell
  - e. What is an aerobic digestion?
  - f. Define Fill Factor.
  - g. Define fermentation in biomass energy?
  - h. What are the advantages of tidal power?
  - i. Are fossile fuels are renewable?
  - j. Define solar cell material?

**SECTION B**

- 2. Attempt any three of the following:** **10 x 3 = 30**
- a. Describe solar photovoltaic (SPV) module with neat sketch?
  - b. What is fuel cell? Define working, operation and advantages?
  - c. Explain the working of horizontal axis two blade windmills with suitable diagram.
  - d. Explain with the help of the diagram, the principle of closed cycle ocean thermal energy conversion system?
  - e. Write short notes on: ( i) Thermoelectric material ( ii) Solar Cell Array

**SECTION C**

- 3. Attempt any one part of the following:** **10 x 1 = 10**
- (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.
  - (b) Explain the mechanism of photoconduction in a PV cell.
- 4. Attempt any one part of the following:** **10 x 1 = 10**
- (a) Define Solar Air Heater with neat sketch and also write its Application?
  - (b) Define Solar Air conditioning and Refrigeration System.
- 5. Attempt any one part of the following:** **10 x 1 = 10**
- (a) Draw schematic diagram of an MHD power generating system having heat recovery steam generator. Explain the functioning of the steam.
  - (b) Describe the principle of working of H<sub>2</sub>-O<sub>2</sub> Cell. Also give limitation.

6. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is the basic difference between thermoelectric and thermionic conversion systems? Also, explain the working of thermoelectric generators.
  - (b) 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 minimum theoretical power can be extracted from the wind turbine?
7. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Explain the 'Single Basin' and 'Two Basin' systems of tidal power. Discuss their advantages and limitations.
  - (b) 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?