

**M. Tech. –III (Chemical Engineering) (CBCS – 2015 Course) :**  
**WINTER - 2018**

**SUBJECT: SELF STUDY PAPER-I: NON-CONVENTIONAL ENERGY SYSTEM**

Date: Saturday  
Day: 08/12/2018

**W-2018-3309**

Time: 11.00 AM TO 02.00 PM  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to the sections to be written in the **SEPARATE** answer books.
- 4) Assume suitable data **WHEREVER** necessary.
- 5) Use of nonprogrammable calculator is permitted.

**SECTION I**

**Q.1.** Define renewable energy and Non renewable energy. Explain various renewable energy sources. **(10)**

**OR**

**Q.1.** Explain in detail various factors responsible for energy crisis. **(10)**

**Q.2.** Elaborate the terms **(10)**

- (i) p-n junction (ii) Doping  
(iii) Fermi level (iv) Biasing

**OR**

**Q.2.** Explain construction and general design criteria of a typical solar cell with neat sketch. **(10)**

**Q.3.** Enumerate the characteristics of turbines that are necessary to produce power from wind. **(10)**

**OR**

**Q.3.** Explain in detail “utility scale wind energy generation”. **(10)**

**SECTION II**

**Q.4.** Write notes on: **(10)**

- i. Pyrolysis of biomass
- ii. Anaerobic fermentation

**OR**

**Q.4.** Draw schematic of biogas plant and explain the process with chemical conversions. **(10)**

**Q.5.** What is geothermal energy? Elaborate EGS (Enhanced Geothermal System) in detail. **(10)**

**OR**

**Q.5.** Explain with schematic, extraction of petrogeothermal energy through Hot Dry Rock (HDR) **(10)**

**Q.6.** Explain recent developments in design of automobile vehicles with respect to efficient use of fuel with less emission. **(10)**

**OR**

**Q.6.** Discuss the present scenario of energy demand and supply in India. Also estimate the future forecast with respect to industrial growth rate in India. **(10)**

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