6. (a) What is the principle of biogas generation by anaerobic digestion process ? Discribe a Gobar Gas Plant in detail. **10**

(b) Enlist different types of Biomass Gasfiers. Discuss in detail any *one* of them. **5**

Unit IV

7. Write notes on the following : **15**

(a) Geothermal Energy, its uitilization and future prospectus.

(b) Hydrogen storage and distribution.

8. (a) What is ocean thermal energy ? Discuss its availability and limitations. **7**

(b) What are the properties which make it an attractive alternative energy source ? Discuss the different methods for hydrogen production. **8**

No. of Printed Pages : 04 **Roll No. .....**

BB-187

M.Tech. EXAMINATION, May 2017

(Second Semester)

(B. Scheme) (Main & Re-appear)

(CHE)

CHE-562-B

RENEWABLE ENERGY TECHNOLOGIES

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Give classification of Energy Resources. Discuss on Renewable energy resources and their Potential in India. **8**

(b) What is Wind Power Plant and explain how it works ? **7**

2. Write notes on the following : **15**

(a) Technical and social Implications of Renewable energy

(b) Wind energy applications and new developments.

(c) Energy conversion technologies.

Unit II

3. Describe the applications of solar energy for the following rural applications : **15**

(a) Solar Refrigeration

(b) Solar Water Heaters

(c) Solar Water Pumping

4. (a) The following data may be used for the design of a solar water heater :

(i) Solar radiation = 5 kWh/m^2/day

(ii) Hot water required = 1000 kg/day

(iii) Hot water temperature = 45ºC

(iv) Cold water temperature = 14ºC

(v) C_{pw} = 1.163 Wh/kg-K

(vi) Mean efficiency of water heater = 48%.

Piping and storage heat losses may be neglected. If a single plant has an area of 2.2 m^2, find out the total area required and number of solar collector modules. **7**

(b) Discuss different solar collectors and also give comparison of different collectors and their performance. **8**

Unit III

5. Write notes on the following : **15**

(a) Biofuel

(b) Characterization of biodiesel

(c) Future prospects in usage of biodiesel.