

Roll No

ME-702 (A)

B.E VII Semester

Examination, December 2016

Renewable Energy System

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

Unit-I

1. a) Define solar constant.
- b) Define terms :
 - i) Altitude angle ii) Incident angle
 - iii) Latitude angle iv) Zenith angle
- c) Explain the principle of conversion of solar energy into heat.
- d) What are the reasons for variation in solar radiations reaching the earth than receive at the outside of the atmosphere?

OR

What are the main components of flat-plate solar collector, explain the function of each?

Unit-II

2. a) Describe horizontal axis wind turbine.
- b) Describe the main consideration in selecting a site for wind generator.
- c) Derive the expression for power developed due to wind.

- d) Describe the different schemes for wind electric generation or describe the generating systems. Also describe the generator control scheme.

OR

How are the W.E.C. systems classified? Discuss in brief.

Unit-III

3. a) How biomass conversion takes place?
- b) What are the difference between biomass and biogas?
- c) What are the factors, which affects the size of the biogas plants?
- d) How are gasifiers classified? What are pyrolysis?

OR

What is meant by Wet Fermentation and Dry Fermentation?

Unit-IV

4. a) What is the basic principle of ocean thermal energy conversion?
- b) What are the main difficulties in tidal power developments?
- c) What type of turbine is best suited for Micro Hydel Plant? Describe it?
- d) Explain with sketches the various methods of tidal power generation. What are the limitations of each method?

OR

Describe the 'closed cycle' OTC system. With its advantages over open cycle system?

Unit-V

5. a) Define Geothermal source.
- b) Write the main applications of hydrogen gas.
- c) What is Fuel Cell? Describe the principle of working of fuel cell with reference to H₂ – O₂ cell.
- d) Derive the expressions for free energy and potential of the fuel cell.

OR

Describe the thermochemical method, for Hydrogen production.