Fifth Semester B.Tech.Degree Examination
(2013 Scheme)
NEW AND RENEWABLE SOURCES OF ENERGY(E)

Time:3 Hours Max.Marks:100

Instructions: Answer all questions from part A and one full question from each Module in Part B.

1 What are the advantages and limitations of renewable energy sources?
2 Explain the problems of solar energy storage and economy of storage
3 Determine the local apparent time (LAT) corresponding to 1530h (IST) at Mumbai (19° 07' N, 72°51'E) on July 1. In India standard time is based on 82.50°E
4 Describe the role of solar green house.
5 What is MPPT?
6 The base area of a tidal power plant is 20x106 m^2.The tidal range is 8m, calculate the energy generated in kwh.
7 How wave energy is different from tide energy?
8 Write the main applications of Fuel cell
9 Name the various models of biogas plant.
10 What is the difference between biomass and biogas? 10x2=20 Marks)

Part B
Module I

11 a) Discuss the need for alternate energy resources and describe the primary sources of alternate energy. 10
b) Describe the classification of methods for solar energy utilisation 10
or
12a) Classify the methods of solar energy storage and explain thermal energy storage system. 10
b) Describe the electric power generation using thermal storage. 10

Module II

13 a) Explain the principle of conversion of solar radiation into heat. 10
b) With a neat circuit diagram explain the working of solar water heater

or

14 a) Explain the design, fabrication and performance of cylindrical parabolic collector. 10
b) A compound parabolic collector is located in Mumbai (19.12N) and is to be used for 8h of collection on December 21 without making a tracking adjustment during the day. Calculate the minimum acceptance angle required for the collector, its concentration ratio and orientation
10

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Module III

15 a) Explain with sketches various methods of tidal power generation. What are the limitations of each method 10

b) Describe the closed OTEC system with its advantages over open cycle system. 10

or

16 a) Derive the expression for power developed due to wind 10

b) A multi-blade wind mill lifts 1.03m^3/h of water through a head of 28m when the wind speed is 3.3m/s. calculate the power coefficient if the rotor diameter is 4.5m, given that transmission efficiency =0.95 and pump efficiency =0.7 10

Module IV

17 a) What is meant by anaerobic digestion? What are the factors which affect biodigestion?explain briefly. 10

b) Calculate (i)the volume of a biogas digester suitable for the output of four cows, and(ii)the power available from the digester. Retention time is 20days, temperature 30°C,dry matter consumed 2kg/day, biogas yield 0.24m^2 per kg. Burner efficiency is 60%,methane proportion is 0.8.Hm the heat of combustion of methane may be assumed to be 28 MJ/m^3 at STP. 10

or

18 a) Write notes on
a)Fuel cell
b)Small hydro resources
c)Power from satellite stations 20