

Code No: 118EE

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, June - 2018

RENEWABLE ENERGY SOURCES

(Common to ME, AME)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List out the applications of solar energy. [2]
- b) Write the principle of sunshine recorder. [3]
- c) Give classifications of solar collector. [2]
- d) What do you understand by Stratified storage? [3]
- e) Classify different wind turbine rotors. [2]
- f) Why horizontal axis wind turbines are preferred over vertical axis wind turbines? [3]
- g) Comment on the origin of geothermal energy. [2]
- h) Compare and contrast different types of tides. [3]
- i) What are the advantages of mini/micro hydro resources? [2]
- j) Differentiate Seebeck and peltier effect. [3]

PART - B

(50 Marks)

- 2.a) What are the reasons for variation in solar radiation reaching the earth and that received outside the earth atmosphere?
 - b) Explain the working of Pyrheliometer with the help of neat sketch. [5+5]
- OR**
- 3.a) Classify renewable energy sources? Explain in brief the need of these energy sources with special reference to India
 - b) What is Solar constant and Explain terrestrial and extra terrestrial solar radiation? [5+5]
- 4.a) Differentiate between sensible and latent heat storage systems with diagrams.
 - b) Explain the working of solar distillation process with a neat sketch. [5+5]
- OR**
- 5.a) Discuss how the concentrating collectors are advantages over flat plate collectors.
 - b) Give a brief account of thermal analysis of a flat plate collector. [5+5]

6.a) Explain with the schematic diagram the working of anaerobic digestion showing input material and effluents.

b) Describe the working of floating dome type biogas plant and state its advantages.[5+5]

OR

7.a) Give a brief description on types of wind turbines.

b) A HAWT having the rotor diameter as 80 m is rotating at 40rpm. The wind speed is 20m/s at 1 atm and 27⁰ C. Calculate the torque produced at the shaft for maximum output of the turbine. [5+5]

8.a) What is the current status of geothermal energy in India.

b) Describe various energy extraction technologies used with hydrothermal resources.[5+5]

OR

9.a) Describe the open cycle OTEC power plant and give the status of OTEC plants in India.

b) Show that wave power is directly proportional to the square of amplitude and inversely proportional to the period of wave. [5+5]

10.a) Explain the Carnot cycle.

b) With the help of a diagram explain the operation of closed cycle MHD generating system. [5+5]

OR

11.a) Explain the heating and cooling applications of a thermoelectric system comment on the materials used for low and high temperature applications

b) Comment on relative performance of fuel cells. [5+5]

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