

**R13**

Code No: 118ED

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year II Semester Examinations, April - 2018****RENEWABLE ENERGY SOURCES****(Electrical and Electronics Engineering)****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) Explain what is meant by Heliostat. [2]
- b) What is the significance of Zenith angle? [3]
- c) Classify the concentrating collectors. [2]
- d) Explain the working of solar drying. [3]
- e) What is meant by gradient height and velocity? [2]
- f) Explain with basic equations the concept of photo synthesis. [3]
- g) What is hyper thermal field in geothermal energy and explain? [2]
- h) Draw cloud cycle of OTEC system. [3]
- i) Explain the concept of DEC and Seebeck effect. [2]
- j) Explain the principle of Thermoionic generator. [3]

**PART - B****(50 Marks)**

- 2.a) How to calculate solar radiation on tilted surfaces?
- b) Calculate the angle made by the beam radiation with the normal to a flat- plate collector, pointing due south located in New Delhi ( $28^{\circ} 38' N$ ,  $77^{\circ} 17' E$ ) at 9:00 hour, solar time on December 1. The collector is tilted at angle of  $360$  with the horizontal. [5+5]

**OR**

- 3.a) Explain what is meant by sun shine recorder and solar radiation data?
- b) Calculate the angle made by beam radiation with the normal to a flat collector on December 1, at 9.00 A.M., solar time for a location at  $28^{\circ} 35' N$ . The collector is tilted at an angle of latitude plus  $10^{\circ}$ , with the horizontal and is pointing due south. [5+5]

**OR**

- 4.a) What is the significance of collectors with porous absorbers.
- b) Draw the line diagram and explain the working of paraboloidal point focusing collector. [5+5]

- 5.a) Explain different methods of latent heat storage techniques with line diagrams.
- b) What are different approaches of thermal electric conversion system from solar energy? [5+5]

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- 6.a) Describe horizontal axis type aero generators.  
b) How are WEC systems are classified? Discuss in detail. [5+5]

OR

- 7.a) How do you produce biogas and explain the methods in detail.  
b) What is meant by energy plantation? What are its advantages and limitations? [5+5]

- 8.a) Draw the line diagram and explain the working of Binary fluid geothermal power system.  
b) With the help of line diagram explain the heat extraction from hot dry rocks. [5+5]

OR

- 9.a) Draw line diagram and explain the Hybrid cycle and its working.  
b) Explain different components of Tidal power plants in detail. [5+5]

10. Explain the principles of Direct Energy Conversion and with the help of line diagram, explain the working details of thermoelectric generator. [10]

OR

11. Explain the working of open cycle MHD system generation and its advantages and limitations. [10]

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