

Code No: 118ED**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year II Semester Examinations, May - 2017****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) What is the need for selecting solar energy as one of the option? [2]
- b) Sketch the short (including visible) and long wave (far infrared) spectral distributions at the top of the atmosphere [3]
- c) Give the classification of concentrating collectors. [2]
- d) What is meant by grid connected solar PV system? How the number of units supplied to grid is measured from PV to grid is measured? [3]
- e) Explain the working principle of windmill. [2]
- f) Present drawbacks of bioenergy. [3]
- g) Discuss the wave energy conversion machines. [2]
- h) What are various methods adopted to drill geothermal wells. [3]
- i) What are direct and indirect gap materials? [2]
- j) State the limitations of Direct Energy Conversion. [3]

Part-B (50 Marks)

- 2.a) Write a technical note on the following
 - i) The hour angle
 - ii) The Sun's declination
- b) Discuss briefly about spectral distribution of extraterrestrial solar irradiance. [5+5]

OR

- 3.a) Discuss about effects and interactions occurring as extraterrestrial solar radiation is incident upon the Atmosphere.
- b) Define daily insolation. Explain its variation of with season and latitude. [5+5]
- 4.a) Differentiate between Flat plate collectors and concentrating collectors?
- b) List the various applications of solar energy. Also explain anyone application, which is economically viable in the present context. [5+5]

OR

- 5.a) Enumerate, with suitable schematic, on the construction details of a flat plate collector.
- b) What are the special arrangements made in solar pond to retain the heat energy content in Solar pond? [5+5]

6. Derive the expression for power developed due to wind energy. [10]

OR

7. List out different Schemes for wind electric generation and explain about anyone. [10]

8.a) Explain the OTEC scheme and mentions its limitation.

b) List the various applications of Geothermal energy. Also specify benefits and limitations of geothermal energy storage. [5+5]

OR

9. Enumerate the environmental issues associated with utilization of following renewable energy sources.

a) Geothermal energy and

b) Open cycle OTEC system. [10]

10.a) What are the two statements known as the Carnot principles?

b) Discuss the need and principle for DEC [5+5]

OR

11. How do you plan for adopting renewable energy generation system in your college? What are the factors that influence the selection of renewable source? [10]

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