

R18

Code No: 158DR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, June - 2024

NON-CONVENTIONAL SOURCES OF ENERGY

(Common to CE, EEE, ECE, MMT, MIE)

Time: 3 Hours

Max. Marks: 75

- Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) What is solar constant. [2]
- b) What are the advantages of flat plate collector? [3]
- c) Explain photovoltaic energy conversion. [2]
- d) What are the various sources of wind energy? [3]
- e) What is anaerobic digestion? [2]
- f) State three classifications of bio gas plant? [3]
- g) What is the potential of geothermal energy in India? [2]
- h) What are the advantages of wave energy? [3]
- i) Draw the carnot cycle. [2]
- j) What factors depends upon the figure of merit. [3]

PART – B

(50 Marks)

- 2.a) What are the different ways in which the solar radiation falls on the earth's surface.
 - b) Discuss about the working principle of Eppley pyrheliometer. [5+5]
- OR**
- 3.a) Describe the working principle of typical liquid collector.
 - b) Discuss about the parabolic trough collector. [5+5]
- 4.a) Describe the working mechanism of solar heat storage.
 - b) Describe the types of solar ponds and its functionality. [5+5]
- OR**
- 5.a) Formulate the power generated in the wind.
 - b) What are the basic components of wind energy conversion system? [5+5]
- 6.a) Describe the wet process of the bio mass energy generation.
 - b) Explain the functioning of different types of bio gas digesters. [5+5]
- OR**
- 7.a) How biomass energy is used for the cooking and IC engine operation.
 - b) Describe the fermentation process in the bio mass conversion. [5+5]

- 8.a) What are the various methods adopted for harnessing the geothermal energy.
b) What are the applications of geothermal energy at different temperatures? [5+5]

OR

- 9.a) Describe the working mechanism of open OTEC cycle.
b) State the economic aspects of the ocean energy. [5+5]

- 10.a) Describe the principle of MHD generators.
b) Explain the Thompson effect and its applications. [5+5]

OR

- 11.a) What is the need for direct energy conversion?
b) Explain the seebeck effect and its applications. [5+5]

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Used Papers 2024