

8E4049

Roll No. _____

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B. Tech. VIII Sem. (Main / Back) Exam., April, 2015
Mechanical Engineering
8ME1 Renewable Energy Technology

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT – I

Q.1 (a) Classify Renewable and Non-Renewable sources of energy and discuss why Renewable Energy Technologies are gaining momentum in the current Energy scenario. [8]

(b) Explain the construction and working of a Solar Flat Plate collector with neat diagrams. [8]

OR

Q.1 (a) Explain the working principle of a Solar Still. Discuss its various types and its major application areas. [8]

(b) Discuss in brief the various photovoltaic applications. [8]

UNIT – II

Q.2 Classify Wind Energy Conversion Systems (WECS) with its characteristics and applications. [16]

OR

- Q.2 (a) What do you understand by Betz limit? Derive the expression for the same. [8]
- (b) Describe the various factors influencing wind. How is wind shear and turbulence related to the selection of WECS? [8]

UNIT – III

- Q.3 (a) What do you understand by Ocean Energy? What are its resources and routes? [8]
- (b) What is the principle of energy conversion through OTEC system? Explain open cycle OTEC system. [8]

OR

- Q.3 (a) What do you mean by Ocean Wave Energy Conversion. Describe one of the methods of power generation through ocean wave. [8]
- (b) Explain with neat diagram the closed cycle OTEC system [8]

UNIT – IV

- Q.4 Write short notes on: [4×4=16]
- (a) Nuclear fission and fusion
 - (b) MHD
 - (c) Geothermal Energy
 - (d) Biomass

OR

- Q.4 What are the various considerations for site selection of a Geothermal Power Plant?
Explain the working of a geothermal power plant with neat sketches. [16]

UNIT - V

- Q.5 (a) Describe the basic design of a fuel cell. What are the electrochemical principles and thermodynamics involved in the working of fuel cell? [8]
- (b) List the various types of fuel cells and describe any one of them. [8]

OR

- Q.5 (a) What are the various hydrogen production methods? Explain one of these methods. [12]
- (b) Discuss the challenges involved in the production of hydrogen. [4]
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