Code No: 5402AZ

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, June/July - 2018

RENEWABLE ENERGY SYSTEMS

(Common to AMS, CAD/CAM, CSE, DECS, DSCE, ES, Env.Eng, HE, MD, Struc.,Engg., TE, VLSI System Design)

Time: 3hrs **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

5 × 5 Marks = 25

1.a) Define solar constant. [5]
b) Write short note on: Darrius rotor. [5]
c) Comment on the variation of tides with location. [5]
d) Explain major principles of EMF generation. [5]
e) What are the potential applications of a fuel cell? [5]

PART-B

5 × 10 Marks = 50

2.a) Why orientation is needed in concentrating type collectors? Describe the different methods of sun tracking.
b) Explain the main features of different types of solar cells based on the active material used in their fabrication. [5+5]

OR

3.a) Describe in brief, the different energy storage methods used in the solar system.
b) What are the advantages and disadvantages of photovoltaic solar energy conversion? [5+5]

4.a) How MHD systems are classified? Describe them in brief.
b) Derive the expression for power developed due to wind. [5+5]

OR

5.a) Derive the equations for the voltage and power output of an MHD generator.
b) Describe with neat sketch the working of a wind energy conversion system (WES) with main components. [5+5]

6.a) Explain the operation of an oscillating water type of wave device.
b) What is the source of tidal energy? What is the minimum tidal range required for a practical tidal plant? How much is the potential in tides? [5+5]

OR

7.a) What do you understand by spring and neap tides? How are they caused?
b) What types of sites are considered suitable for wave power development? [5+5]

8.a) Describe the main types of turbines in brief, which may be used for Geothermal energy conversion.

b) What do you understand by cogeneration? How is TES different from Integrated energy system? [5+5]

OR

9.a) How much energy-saving potential exists in the Indian industry without any major investment?

b) What is the present annual primary energy consumption of the world? At what rate is growing? [5+5]

10.a) What is the present state of development in fuel-cell technology?

b) What are the advantages of batteries for bulk energy storage and comment on environmental effects of fuel cell? [5+5]

OR

11.a) What are the different classes of batteries? Describe briefly a high temperature battery for road vehicles.

b) Explain in brief what are the various principles of energy conservation? [5+5]

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