Code No: 118EE

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, April - 2018
RENEWABLE ENERGY SOURCES
(Common to ME, AME)

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 solar constant?	[2]
b)	Differentiate terrestrial and extra terrestrial solar radiation.	[3]
c)	What are the advantages of concentrating collectors?	[2]
d)	What do understand by photovoltaic conversion?	[3]
e)	What is Betz limit?	[2]
f)	List out three differences between horizontal and vertical axis wind turbine.	[3]
g)	What is the difference between fissures and fumaroles in geothermal energy?	[2]
h)	What is the principle of OTEC?	[3]
i)	List out the limitations of Carnot cycle.	[2]
j)	Write the principle of fuel cells.	[3]

PART - B

(50 Marks)

2.a) Discuss on potential of renewable energy sources with reference to India.
b) Explain the working of Pyrometer with the help of neat sketch. [5+5]

OR

3.a) Explain in brief the need for exploiting renewable energy sources.
b) Explain the working of sunshine recorder with a neat sketch. [5+5]

4.a) With a neat sketch explain working of solar water heating systems
b) With the help of schematic diagram explain solar passive space cooling system. [5+5]

OR

5.a) How are solar collectors classified? What are the important features of a solar collector?
b) Classify different solar energy storage systems and explain them in brief. [5+5]

6.a) Discuss the prospects and status of wind energy in India.
b) Show that a wind turbine cannot extract more than 59.3% of wind energy. [5+5]

OR

7.a) Give a brief description on types of wind turbines.
b) Derive an expression for maximum power coefficient for a horizontal axis wind turbine. [5+5]

8.a) Briefly describe different analytical methods to estimate geothermal potential.
   b) Discuss vapour dominated geothermal plant with a diagram.   [5+5]

OR

9.a) Explain the closed cycle OTEC plant and list out the major problems associated OTEC.
   b) What is the source of tidal energy? What is the minimum tidal range required for the working of a tidal plant? How much is the potential in tides?   [5+5]

10.a) Explain the principle of dissociation and ionization with respect to MHD.
    b) What is the principle of MHD power generation and discuss about the main parts of an MHD generator?   [5+5]

OR

11.a) Explain (i) Seebeck (ii) Peltier and (iii) Joule Thomson effects.
    b) Explain the principle of operation of an alkaline fuel cell with the aid of a diagram.   [5+5]

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