R13

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 contest. [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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Code No: 118EE

AME3

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, May - 2017

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)	Define altitude angle, zenith angle and Azimuth angle.	[2]
b)	Why do use pyranometer and its uses?	[3]
c)	Explain electro magnetic energy storage method.	[2]
d)	What is meant by solar green house?	[3]
e)	What the significance of strip chart and magnetic tap.	[2]
f)	Explain what is meant by tip speed ratio.	[3]
g)	Draw the hydrothermal convective region.	[2]
h)	What is meant by Bio fouling.	[3]
i)	What are the Limitations of Carnot cycle in DEC?	[2]
j)	Explain the concept of see beck effect.	[3]

PART - B

(50 Marks)

2.a) What are the reasons for variation in solar radiation reaching the earth than received at the onside of the atmosphere?

b) Calculate the angle made by the beam radiation with normal to a flat plate collector, pointing due south located New Delhi (28^0 38'N, 77^0 17'E) at 9:00 hr, solar time on December 1. The collector is tilted at an angle of 36^0 with the horizontal. [5+5]

OR

3.a) How do you calculate solar radiation on tilted surfaces?

b) List out the steps involved in the calculation of local solar time and day length and give needed formulae. [5+5]

4.a) Derive the equation for solar energy balance equation and collector efficiency their advantages and limitations.

b) Enumerate different types of concentrating collectors and also list out advantages and limitations. [5+5]

OR

5.a) Describe the layout and working of a continuous solar cooling system.

b) Explain the principle of solar photovoltaic power generation. [5+5]

6.a) Explain the advantages and limitations of wind energy conversion systems.

b) Derive the expression for power developed due to wind. [5+5]

OR

7.a) Compare and contrast the biomass and biogass.

b) What is a community biogas plant? Explain the problems encountered in it.[5+5]

8.a) With line diagram, explain the heat extraction from hot dry rocks.
b) What are the possible sources of geothermal pollution? How to avoid them? [5+5]

OR

9.a) Draw the line diagram and explain the working of hybrid OTEC cycle.
b) Explain the working of single basin tidal power plant. [5+5]

10.a) Explain the concept of joule Thompson effect and its applications.
b) Explain the working details of MHD accelerator. [5+5]

OR

11.a) Draw the line diagram and explain the working of hydrogen fuel cell.
b) What is meant by Electron gas dynamic conversion and where do you use this principle. [5+5]

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