Code No: 156EA **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, August/September - 2024
RENEWABLE ENERGY SOURCES
(Common to CE, ME, ECE)

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)	Define altitude angle, zenith angle and Azimuth angle.	[2]
b)	Why do use pyranometer and its uses?	[3]
c)	Explain electromagnetic energy storage method.	[2]
d)	What is meant by solar green house?	[3]
e)	What is 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) Explain the advantages and limitations of wind energy conversion systems.
b) Derive the expression for power developed due to wind. [5+5]

OR

3.a) Compare and contrast the biomass and biogas.
b) What is a community biogas plant? Explain the problems encountered in it. [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. Derive the mathematical description of the self-excitation process. [10]

OR

7. Explain the steady state operation of the induction generator with its equivalent model. [10]

8. Explain the following terms of Lead-Acid Batteries:
   a) Battery charge and discharge cycles
   b) Advantages and disadvantages. [5+5]

OR

9. Explain the operation of compressed air energy storage. [10]

10. Write a short note on the following:
    a) Multiple renewable energy sources
    b) Alternative energy sources. [5+5]

OR

11. Explain in detail about integration of multiple renewable energy sources. [10]

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