Code No: 158DR **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech IV Year II Semester Examinations, July - 2023
NON-CONVENTIONAL SOURCES OF ENERGY
(Common to CE, ECE, MIE, PTM)

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)	If the energy received by $7m^2$ area in 5 minutes is 3000 kj, calculate the value of solar constant.	[2]
b)	Why is collecting solar radiation data important?	[3]
c)	Distinguish between sensible heat and latent heat.	[2]
d)	What are the properties of various layers situated in a solar pond?	[3]
e)	Write the differences between biomass and biogas.	[2]
f)	Name the various factors that affect bio-digestion.	[3]
g)	List the different types of geothermal wells.	[2]
h)	What is the site selection criteria for setting up an OTEC plant?	[3]
i)	Give the working principle of direct energy conversion system.	[2]
j)	What are the advantages of using fuel cells?	[3]

PART – B

(50 Marks)

2.a)	Name some important renewable energy sources and tell about their role in India.	
b)	How is solar radiation being measured? Explain.	[5+5]
	OR	
3.a)	List the components of a solar flat plate collector and explain their operations.	
b)	Enumerate different types of concentrating collectors.	[5+5]
4.a)	Give the basic working principle of a photovoltaic energy conversion system.	
b)	How does a solar distillation plant work?	[5+5]
	OR	
5.a)	Wind Energy is the important renewable energy source in India. Analyze it.	
b)	Why in urban areas vertical axis wind turbines are chosen? Explain.	[5+5]
6.a)	State the principle and operation of the bio conversion system.	
b)	With a neat diagram explain the operation of any one of the biogas digesters.	[5+5]
	OR	
7.a)	How can biogas be utilized for the operation of IC engines? Explain.	
b)	Write briefly about the economic aspect of biogas.	[5+5]

8.a) Does geothermal energy have a potential future in India? Justify your answer.
b) Explain in detail about the operation of a OTEC plant. [5+5]

OR

9.a) What do you know about the generation of electricity from ocean waves?
b) Analyze the operation of small hydro plants in-terms of economics. [5+5]

10.a) Why is there a need for a direct energy conversion system? Explain.
b) How do thermoelectric generators work? Explain. [5+5]

OR

11.a) With a neat diagram, explain the working of MHD generators.
b) Write a note on the selection of fuels for fuel cells. [5+5]

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