

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM**  
**III B. Tech I Semester Regular Examinations November -2025**  
**Renewable Energy Sources**  
**(DEPARTMENT OF EEE)**

**Time: 3 hours****Max. Marks: 70****The Question paper consists of Part A & Part B.****Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.****\*\*\*\*\***

1		<b>PART-A</b>	<b>(20Marks)</b>
	a)	What is meant by renewable Sources ? List out different renewable Sources of energy ?	[2]
	b)	Define Solar energy storage system ?	[2]
	c)	What is the principle of operation of wind energy ?	[2]
	d)	What are benefits of wind energy ?	[2]
	e)	Define Geothermal energy ?	[2]
	f)	What are the different types of Geothermal energy ?	[2]
	g)	What are the merits of OTEC ?	[2]
	h)	What is meant by wave energy ?	[2]
	i)	Define fuel cell ?	[2]
	j)	Define Hydrogen energy ?	[2]
		<b>PART-B</b>	<b>(50Marks)</b>
		<b>Question from Unit - I</b>	
2	a)	Draw and explain the equivalent circuit of a Photovoltaic cell I-V characteristics ?	[5]
	b)	Define concentric collectors ? Describe the characteristics of concentric collectors of a PV system ?	[5]
		<b>(OR)</b>	
3	a)	Describe the benefits of Solar radiation at the earth surface ?	[5]
	b)	Explain the applications of Solar Green Houses ?	[5]
		<b>Question from Unit - II</b>	
4	a)	Explain about the generator and controller that are used for the basic components of WECS ?	[5]
	b)	What is meant by the power in wind ? Derive the formula for power in wind ?	[5]
		<b>(OR)</b>	
5	a)	Describe the principle and working of Horizontal Axis Wind Turbine ?	[5]
	b)	Discuss the various applications of wind energy conversion systems ?	[5]
		<b>Question from Unit - III</b>	
6	a)	Describe about the process of Photosynthesis with governing equations with a neat sketch ?	[5]
	b)	Distinguish between operations of Large hydro and small hydro systems ?	[5]
		<b>(OR)</b>	
7	a)	What are the applications of geothermal energy ?	[5]

	b)	Describe the factors affecting Bio digestion ?	[5]
		Question from <b>Unit - IV</b>	
8	a)	Explain about the process of open cycle which is used a one of the method for OTEC ?	[5]
	b)	Derive the power which generated from waves ?	[5]
		(OR)	
9	a)	What are the merits of wave energy ?	[5]
	b)	What are the prospects of OTEC in India ?	[5]
		Question from <b>Unit - V</b>	
10	a)	What are the applications of Hydrogen energy ?	[5]
	b)	Explain the equivalent circuit of Fuel cell ?	[5]
		(OR)	
11	a)	Explain the working of PEM fuel cells ?	[5]
	b)	Describe the working and applications of closed cycle operation of a MHD power generation ?	[5]

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