

Code: 23EE2501

**III B.Tech - I Semester - Regular Examinations - NOVEMBER 2025**

**RENEWABLE ENERGY SOURCES**  
**(Common for ALL Branches)**

**Duration: 3 hours****Max. Marks: 70**


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Note: 1. This question paper contains two Parts A and B.  
 2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.  
 3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.  
 4. All parts of Question paper must be answered in one place.

**BL – Blooms Level****CO – Course Outcome****PART – A**

		<b>BL</b>	<b>CO</b>
1.a)	What is a flat plate solar collector?	L2	CO2
1.b)	Write two examples of solar energy storage systems.	L2	CO2
1.c)	Classify WECS based on orientation.	L1	CO1
1.d)	Mention any two applications of wind energy.	L3	CO2
1.e)	Mention any two factors affecting bio-digestion.	L3	CO3
1.f)	What is geothermal energy?	L1	CO5
1.g)	Write the formula for power from ocean waves.	L3	CO4
1.h)	Mention any two wave energy conversion devices.	L1	CO1
1.i)	Define a fuel cell.	L1	CO1
1.j)	State any two applications of hydrogen energy.	L2	CO4

## PART – B

			BL	CO	Max. Marks
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### UNIT-I

2	a)	Interpret differences between flat plate collectors and concentrating collectors.	L3	CO2	5 M
	b)	Infer I–V and P–V characteristics of a photovoltaic cell.	L4	CO5	5 M

### OR

3	a)	Illustrate the principle and applications of solar water heating systems.	L3	CO2	5 M
	b)	Demonstrate a short note on solar greenhouses.	L3	CO2	5 M

### UNIT-II

4	a)	Infer the expression for power in the wind.	L4	CO5	5 M
	b)	Explain the limitations of wind energy.	L4	CO5	5 M

### OR

5	a)	Illustrate the working of a horizontal axis wind turbine.	L3	CO2	5 M
	b)	Explain how wind power contributes to renewable energy supply.	L4	CO5	5 M

### UNIT-III

6	a)	Demonstrate the process of bio-digestion and factors affecting it.	L3	CO3	5 M
	b)	Illustrate the differences between large hydel plants with small hydel plants.	L3	CO3	5 M

### OR

7	a)	Demonstrate the basic working principle of hydro power plants with a neat sketch.	L3	CO3	5 M
	b)	Interpret the operational and environmental problems of geothermal energy.	L3	CO3	5 M

### **UNIT-IV**

8	a)	Illustrate the working principle of OTEC with a neat sketch.	L3	CO4	5 M
	b)	Infer various wave energy conversion devices with examples.	L4	CO5	5 M

### **OR**

9	a)	Illustrate the basic principle of tidal energy with a neat sketch.	L3	CO4	5 M
	b)	Interpret the environmental impacts of ocean, tidal, and wave energy systems.	L3	CO4	5 M

### **UNIT-V**

10	a)	Illustrate different types of fuel cells and their applications.	L3	CO4	5 M
	b)	Interpret the storage methods of hydrogen.	L3	CO4	5 M

### **OR**

11	a)	Illustrate with a diagram the working of an MHD generator.	L3	CO4	5 M
	b)	Demonstrate different methods of hydrogen production.	L3	CO4	5 M