CBCS SCHEME

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BEE654B

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Technologies of Renewable Energy Sources

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	List the different types of energy resources.	3	L1	CO1
	b.	Discuss the causes of energy scarcity and factors to be considered for solving energy crunch problem.	10	L2	CO1
	c.	With a neat diagram, explain the layers of sun and explain factors affecting Solar Energy reaching the Earth's surface.	7	L2	CO1
		OR			
Q.2	a.	Explain how solar thermal energy is used in different application. Provide examples of each application and discuss their benefits and limitations.	5	L2	CO1
	b.	Describe the Sun-Earth geometric relationship and its impact on the amount of solar energy received on the Earth's surface.	7	L2	CO1
	c.	Compare the advantages and disadvantages of different types of renewable energy resources.	8	L2	CO1
		Module – 2			
Q.3	a.	Name any three types of solar thermal collectors.	3	L1	CO2
	b.	Describe the basic principle of operation of a stirling engine.	10	L2	CO2
	c.	Compare the advantages and disadvantages of series and parallel connection in solar panel arrays.	7	L2	CO2
		OR			
Q.4	a.	How would you select materials for a solar collector to maximize efficiency and durability?	5	L3	CO2
	b.	Describe the importance of solar cell efficiency and its impact on system design.	7	L2	CO2
	c.	Analyze the impact of solar thermal system on building energy consumption and green house gas emission.	8	L4	CO2
		Module – 3			
Q.5	a.	What are the benefits of using hydrogen energy?	3	L1	CO3
	b.	Describe the importance of wind resource assessment in wind turbine site selection.	10	L2	CO3
	c.	A local municipality wants to implement a waste recycling program. Considering the advantages (e.g conservation of natural resources energy saving reduced land fill waste) and disadvantages (e.g high upfront costs, contamination risks, limited market demand) of waste recycling, design a program that maximizes benefits while minimizing draw backs.	7	L3	CO3

		OR			
Q.6	a.	Compare the advantages and disadvantages of different geothermal systems.	5	L3.	CO3
	b.	Describe the different methods of hydrogen storage.	7	L2	CO3
	c.	Write the comprehensive analysis of the environmental effects of geothermal energy production and recommend mitigation strategies.	8	L4	CO3
		Module – 4			
Q.7	a.	List the Gasifier and their classification.	3	L1	CO4
	b.	Explain the difference between Updraft, downdraft, and crossdraft gasifier.	10	L2	CO4
	c.	Describe the cooling and cleaning of gasifier.	7	L2	CO4
		OR			
Q.8	a.	What are the advantages of Tidal power?	5	L1	CO4
	b.	What factor influence the selection of a biogas plant model for a specific application.	7	L2	CO4
	c.	With a neat diagram, explain the two basin system.	8	L3	CO4
		Module – 5			
Q.9	a.	What are the advantages and disadvantages of OTEC?	3	L1	CO5
	b.	Compare and contrast closed, open and hybrid cycles used in OTEC, highlighting their advantages and disadvantages.	10	L2	CO5
	c.	Evaluate the feasibility of the wave energy availability including its environmental impact economic viability.	7	L3	CO5
		OR			
Q.10	a.	Evaluate the feasibility of an OTEC plant for a specfic tropical location considering factors likes temperature difference, water flow rates and energy output.	5	L3	CO5
	b.	How do sea waves generate energy and what factors affect their power output?	7	L2	CO5
	c.	Briefly, explain the basic Rankine cycle and its working.	8	L2	CO5

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