CBCS SCHEME

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BETCK105E

First Semester B.E./B.Tech. Degree Examination, June/July 2025
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.	What are the principles of Renewable Energy? Explain the causes of Energy scarcity.	06	L2	CO1
	b.	Classify the Renewable Energy Sources. What are the factors affecting energy resource development.	08	L2	CO1
	c.	Discuss the Indian Energy availability.	06	L2	CO1
		OR			
Q.2	a.	What are the advantages and limitations of Renewable Energy Sources?	06	L2	CO1
	b.	Explain briefly the energy sources based on : i) Wind energy ii) Tidal energy iii) Biomass energy iv) Ocean thermal energy.	10	L2	CO1
	c.	Write a note on Internet of Energy (IOE).	04	L2	CO1
		Module – 2			
Q.3	a.	What are the devices used for the measurement of Solar Radiation? With a neat figure explain the working of Angstorm type Purheliometer.	06	L2	CO2
	b.	Explain the advantages of Solar Pond. Discuss the operation of solar pond electric power generation.	06	L2	CO2
	c.	Briefly explain any four solar thermal energy applications.	08	L2	CO2
		OR			
Q.4	a.	With a neat sketch, discuss the operation of solar flat plate collector with main parts.	07	L2	CO2
	b.	Explain the principle of Solar photovoltaic power generation. What are the main components?	07	L2	CO2
	c.	What are the advantages and applications of Solar PV cells?	06	L2	CO2
		Module – 3			
Q.5	a.	Explain the working principle of Wind Energy. What are the classifications of Wind Energy systems?	6	L2	CO3
	b.	Explain with structure of Wind Energy Conversion System (WECS) with functions of each part.	8	L2	CO3

	c.	Derive an expression for power available in the wind.	6	L3	CO3
		OR			
Q.6	a.	Classify the biomass conversion technologies. Explain clearly the factors affecting the biogas generation.	8	L2	CO3
	b.	Explain with block diagram of Urban Waste Recovery Management Scheme.	6	L2	CO3
	c.	What are the applications of Gassifiers? Explain with neat sketch, the working of downdraft Gassifiers.	6	L2	CO3
		Module – 4			
Q.7	a.	What is the working principle of Tidal energy conversion? Explain the single basin type tidal power plant.	7	L2	CO4
	b.	What are the advantages and limitations of wave energy? Explain the various devices for harnessing wave energy.	8	L2	CO4
	c.	Write a note on the tidal power generation in India.	5	L2	CO4
		OR			
Q.8	a.	What is the working principle of OTEC plants? Explain the OTEC system based on open cycle plant.	7	L2	CO4
	b.	State the merits and demerits of OTEC plants. Describe the closed cycle OTEC plants.	7	L2	CO4
	c.	State the types of Tidal energy schemes. Discuss the relative merits and demerits of Tidal power.	6	L2	CO4
		Module – 5			
Q.9	a.	What is fuel cell? Explain the basic principle of fuel cell with reference to $H_2 - O_2$.	7	L2	CO5
	b.	What are classification of fuel cells? Explain the Hydrogen energy storage and applications.	8	L2	CO5
	c.	Write a note on Zero energy concepts.	5	L2	CO5
		OR			
Q.10	a.	Explain the different hydrogen production technologies.	8	L2	CO5
	b.	Explain the advantages and disadvantages of fuel cells.	6	L2	CO5
	c.	Explain the problems associated with hydrogen energy.	6	L2	CO5

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