CBCS SCHEME

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BME654B

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026
Renewable Energy Power Plants

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.	Explain briefly different renewable and non-renewable energy sources.	10	L2	CO1
	b.	Differentiate between beam radiation, diffuse radiation and global radiation. How do these types of radiation impact solar energy systems?	10	L2	CO1
		OR			
Q.2	a.	How does global energy demand vary across different regions of the world? Explain briefly with in detail information of each country.	10	L2	CO1
	b.	Define solar constant and discuss its significance in the study of solar energy. How does it affect solar power generation?	10	L2	CO1
		Module – 2			
Q.3	a.	Compare and contrast the different types of solar power plants: grid-tied, off-grid and hybrid systems. Discuss their advantages and disadvantages.	10	L2	CO2
	b.	Describe the process of solar thermal conversion and compare it with photovoltaic energy conversion. Which applications are best suited for each method?	10	L2	CO2
		OR			
Q.4	a.	With help neat sketch describe solar distillation system and solar flat plate collector.	10	L2	CO2
	b.	With the help of neat sketch, enumerate the concept behind the solar pond and solar chimney.	10	L2	CO2
		Module – 3			
Q.5	a.	Describe the methodology involved in wind resource assessment. What are the major factors considered when selecting a wind power plant site?	10	L2	CO3
	b.	With the help of neat schematic diagram, explain the three main types of geothermal power stations: dry steam, flash steam and binary cycle plants.	10	L2	CO3

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		OR			
Q.6	**a.**	Explain the challenges and considerations involved in the grid integration of wind power. How does wind variability affect power system stability?	**10**	**L2**	**CO3**
	b.	What are the main problems associated with geothermal energy conversion? Discuss issues related to environmental impact, resource deplation and technical challenges.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Describe the fundamental characteristics of tidal power. What are the main parameters that affect bridal energy generation?	**10**	**L2**	**CO4**
	b.	With the help of a schematic diagram. Explain the working principle of a tidal power plant. Mention the different types of tidal power systems.	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	Explain the principle of operation of OTEC systems. How does the temperature difference in ocean layers enable power generation?	**10**	**L2**	**CO4**
	b.	Discuss the technical and environmental problems, associated with OTEC. How do these challenges impact the large scale deployment of OTEC systems?	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Define a biogas plant and list and explain the Key Operational parameters that affect its performance.	**10**	**L2**	**CO5**
	b.	Describe the structure and working of a floating drum (constant pressure) biogas plant.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the process of electrolysis of water for hydrogen production. Include a labeled diagram.	**10**	**L2**	**CO5**
	b.	Discuss the safety issues associated with the production, storage and transportation of Hydrogen.	**10**	**L2**	**CO5**

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