U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Institutional Elective **Duration: 3 hrs.**
Course Code: 19CH7OEAET **Max Marks: 100**
Course: Advances in Energy Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

				CO	PO	Marks
			UNIT - I			
1	a)		Classify Energy Resources based on their usability and discuss each category.	*CO1*	*PO2*	**06**
	b)		Explain various types of fossil fuels and describe their formation.	*CO1*	*PO2*	**08**
	c)		Differentiate between renewable and non-renewable energy sources.	*CO2*	*PO7*	**06**
			UNIT - II			
2	a)		Define terrestrial and extraterrestrial radiation and explain why extraterrestrial radiation is more than terrestrial radiation.	*CO3*	*PO2*	**06**
	b)		Explain the linear Fresnel lens solar collector along with a diagram.	*CO3*	*PO2*	**08**
	c)		Illustrate between a solar module, solar panel, and solar array.	*CO5*	*PO3*	**06**
			UNIT - III			
3	a)		Define gasification and explain the working principle of updraft gasifier with a neat diagram.	*CO3*	*PO2*	**10**
	b)		Discuss the influence of various factors on biogas yield and suggest strategies for optimizing biogas production.	*CO6*	*PO2*	**10**
			OR			
4	a)		Explain the working of an incinerator for extracting energy from biomass, along with a neat diagram.	*CO3*	*PO2*	**10**
	b)		Discuss various types of geothermal resources, highlighting their potential for energy generation.	*CO4*	*PO6*	**10**
			UNIT - IV			
5	a)		Explain the various components of a horizontal wind-axis turbine along with a diagram.	*CO5*	*PO3*	**12**
	b)		Discuss the working principle of a Savonius turbine and its applications.	*CO3*	*PO2*	**08**

			OR			
	6	a)	Derive the mathematical expression for wind power potential and discuss the advantages and disadvantages of wind energy.	***CO4***	***PO6***	**10**
		b)	Explain the various components of a hydropower plant with a well-labeled diagram.	***CO4***	***PO6***	**10**
			UNIT - V			
	7	a)	With a neat sketch explain the operating principle of a fuel cell, using hydrogen as the fuel. Illustrate the flow of and electrons the flow of ions and electrons.	***CO3***	***PO2***	**10**
		b)	Explain the working principle of a molten carbonate fuel cell along with neat diagram.	***CO3***	***PO2***	**10**

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