U.S.N.										

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

Autonomous Institute Affiliated to VTU

January / February 2025 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.

			UNIT - I	*CO*	*PO*	Marks
1	a)		How can energy resources be classified?	*CO1*	*PO2*	**06**
	b)		Evaluate the importance of per capita energy consumption as an indicator for the standard of living.	*CO2*	*PO7*	**07**
	c)		Discuss the possibility of exploiting the non-conventional energy in India.	*CO2*	*PO7*	**07**
			OR			
2	a)		How can renewable energy benefit the environment?	*CO1*	*PO2*	**06**
	b)		What are conventional and non-conventional energy sources? Explain briefly.	*CO3*	*PO2*	**08**
	c)		Discuss about the need for alternate energy.	*CO1*	*PO2*	**06**
			UNIT - II			
3	a)		Differentiate between a pyrheliometer and pyranometer.	*CO3*	*PO2*	**06**
	b)		Classify the solar collectors. Illustrate the important features of a solarcollector?	*CO3*	*PO2*	**06**
	c)		Explain the principle of solar photovoltaic.	*CO3*	*PO2*	**08**
			OR			
4	a)		What are the main advantages of a flat plate solar collector?	*CO3*	*PO2*	**06**
	b)		What is the difference between extraterrestrial and terrestrial solar radiations? Give reasons for the difference.	*CO3*	*PO2*	**08**
	c)		List out the applications of solar energy.	*CO6*	*PO2*	**06**

			UNIT - III			
	5	a)	Discuss the current state of biomass energy in India and its global trajectory. Explain challenges that are impeding the expansion of the bioenergy sector.	*CO4*	*PO6*	**10**
		b)	With the help of a process flow sheet, explain pyrolysis. List the products of pyrolysis?	*CO3*	*PO2*	**10**
			OR			
	6	a)	Discuss the environment problems caused by geothermal energy.	*CO4*	*PO6*	**08**
		b)	Calculate the volume of cow dung-based biogas plant to meet cooking requirement of five persons (230 L/day), and lighting of three 100 CP mantle lamps consuming 120 L/h for 3 h. Also, calculate the required number of cows to run the plant in case cow dung produced is 1 kg/day and collection efficiency is 70%, percentage of solid is 16% and production of gas from solid is 340 L/kg.	*CO5*	*PO3*	**12**
			UNIT - IV			
	7	a)	What type of turbine are used in hydropower? Elucidate the construction and working of any one type of turbine.	*CO3*	*PO2*	**12**
		b)	List the advantages and disadvantages of a small-scale hydropower scheme.	*CO6*	*PO2*	**08**
			OR			
	8	a)	Derive the expression for power developed due to wind and show that a wind turbine cannot extract more than 59.3 % wind energy.	*CO5*	*PO3*	**12**
		b)	Explain the basic components of wind energy conversion system with a neat sketch.	*CO3*	*PO2*	**08**
			UNIT -V			
	9	a)	Classify the fuel cell based on electrolytes, on the types of fuel and oxidants, on operating temperature, on application and on the chemical nature of the electrolytes.	*CO6*	*PO2*	**05**
		b)	Explain the construction and working of alkaline fuel cell.	*CO3*	*PO2*	**10**
		c)	What are the potential applications of fuel cell? List the common fuels that can be used in fuel cell.	*CO6*	*PO2*	**05**
			OR			
	10	a)	Explain the principle of operation of an alkaline fuel cell.	*CO3*	*PO2*	**08**
		b)	Describe the classification of fuel cell.	*CO3*	*PO2*	**06**
		c)	What are the advantages of fuel cells?	*CO3*	*PO2*	**06**

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