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: V**

Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**

Course Code: 23EE5PE1SE **Max Marks: 100**

Course: Sustainable Energy Systems

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)	What are the renewable energy sources? Explain in brief the prospects of renewable energy sources.		*CO1*	*PO1*	**08**
	b)	Explain the principle operation of Fluidized bed combustion?		*CO1*	*PO1*	**06**
	c)	List out the advantages and disadvantages of fluidized bed combustion.		*CO1*	*PO1*	**06**
			OR			
2	a)	Discuss the social implication of renewable energy sources.		*CO1*	*PO1*	**06**
	b)	Differentiate between renewable and non-renewable sources.		*CO1*	*PO1*	**06**
	c)	With neat a diagram explain the fluidized bed combustion.		*CO1*	*PO1*	**08**
			UNIT - II			
3	a)	With neat a diagram explain the working principle of thermal power plant.		*CO2*	*PO7*	**08**
	b)	What are the main factors required for site selection of hydro-electric power plant.		*CO2*	*PO7*	**04**
	c)	Write in brief the operation principle of nuclear power stations.		*CO2*	*PO7*	**08**
			OR			
4	a)	Discuss in detail about the classification of hydroelectric power plant and explain any one type in detail.		*CO2*	*PO7*	**10**
	b)	What are factors considered for site selection of nuclear power plant.		*CO2*	*PO7*	**05**
	c)	Discuss about the site selection factors of thermal power plant.		*CO2*	*PO7*	**05**

			UNIT - III			
	5	a)	Draw the equivalent circuit of solar cell and explain the I-V characteristics, derive the expression for conversion efficiency and maximum power output.	*CO2*	*PO7*	**10**
		b)	Explain the concept of partial shading when 8 modules are shaded.	*CO2*	*PO7*	**06**
		c)	What are the remedies for partial shading of solar cell?	*CO2*	*PO7*	**04**
			OR			
	6	a)	Explain with a block diagram the operation principle of PV system for power generation.	*CO2*	*PO7*	**10**
		b)	What is the difference between standalone and grid connected system? Discuss about grid connected system.	*CO2*	*PO7*	**10**
			UNIT - IV			
	7	a)	Describe with a neat block diagram the principle of wind energy conversion systems.	*CO3*	*PO7*	**10**
		b)	Explain the concept of smart grid and mention any five objectives of smart grid.	*CO3*	*PO7*	**10**
			OR			
	8	a)	What are the types of wind turbines? Explain in detail any one of them.	*CO3*	*PO7*	**08**
		b)	Write any three advantages and disadvantages of wind energy conversion system.	*CO3*	*PO7*	**06**
		c)	What is the meaning of mini grid? and explain its working.	*CO3*	*PO7*	**06**
			UNIT - V			
	9	a)	Write short notes on load duration curve.	*CO3*	*PO7*	**06**
		b)	Define demand factor, load factor, and plant use factor.	*CO3*	*PO7*	**06**
		c)	Describe simple tariff and block rate tariff with its application.	*CO3*	*PO7*	**08**
			OR			
	10	a)	What is tariff? Explain any 4 types of tariff.	*CO3*	*PO7*	**12**
		b)	Discuss the following terms i. Plant use factor ii. Maximum demand iii. Average load iv. Plant Capacity Factor	*CO3*	*PO7*	**08**

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