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

Autonomous Institute Affiliated to VTU

February / March 2025 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**
Course Code: 22EE1ESRES / 22EE2ESRES **Max Marks: 100**
Course: Renewable Energy Sources

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)	Define and enlist the primary and secondary energy sources.	CO1	PO7	**04**
	b)	List any six renewable energy sources, also mention that how these energies are obtained.	CO1	PO7	**06**
	c)	With a neat schematic diagram, elucidate the generation of hydroelectric energy.	CO1	PO7	**10**
		OR			
2	a)	Contrast renewable energy sources and non-renewable energy sources.	CO1	PO7	**04**
	b)	Explain how social, economic, technical, regulatory and selection of land hinder the large-scale adoption of renewable energy.	CO1	PO7	**06**
	c)	Explain the role of each component in the biomass energy conversion process with the help of a block diagram.	CO1	PO7	**10**
		UNIT - II			
3	a)	With a neat diagram explain the construction and working of pyranometer.	CO2	PO2	**10**
	b)	With labelled sketches wherever necessary, define the following terminologies. i) Solar radiation ii) Global radiation iii) Scattered radiation iv) Absorption v) Beam radiation vi) Diffuse radiation	CO2	PO2	**10**
		OR			
4	a)	With a neat diagram, explain the construction and working of a pyrheliometer.	CO2	PO2	**10**
	b)	What is the operating principle of a Solar cell? Explain the construction and working of a solar cell. Also draw the I-V characteristic curves.	CO2	PO2	**10**

			UNIT - III			
	5	a)	Derive the expression for power available and the maximum power extracted from wind using a wind turbine.	*CO3*	*PO1*	**10**
		b)	With the help of neat sketches, explain the construction and working of Darrieus type wind turbines.	*CO3*	*PO1*	**10**
			OR			
	6	a)	With a labelled diagram, explain the working of single blade and three blade horizontal axis wind turbine.	*CO3*	*PO1*	**10**
		b)	Discuss in detail the safety systems incorporated in a wind energy conversion system.	*CO3*	*PO1*	**10**
			UNIT – IV			
	7	a)	List the advantages and disadvantages of OTEC system.	*CO3*	*PO1*	**05**
		b)	What are the key factors to consider when selecting a site for an OTEC plant?	*CO3*	*PO1*	**05**
		c)	With a neat schematic explain the construction and working of closed cycle ocean thermal energy conversion system.	*CO3*	*PO1*	**10**
			OR			
	8	a)	Outline the advantages, limitations and applications of tidal power system.	*CO3*	*PO1*	**05**
		b)	Assess the potential environmental impacts of OTEC.	*CO3*	*PO1*	**05**
		c)	With a neat sketch explain the working of a single basin tidal system.	*CO3*	*PO1*	**10**
			UNIT – V			
	9	a)	What is gasification of biomass? With the help of a schematic diagram and relevant reactions, explain the biomass gasification process in a downdraft gasifier.	*CO3*	*PO1*	**10**
		b)	Compare the working of Phosphoric Acid Fuel Cell and Alkaline Fuel Cell.	*CO3*	*PO1*	**10**
			OR			
	10	a)	With a neat schematic explain the construction and working of fixed dome biogas plant	*CO3*	*PO1*	**10**
		b)	With a neat schematic, explain the construction and working of a power plant to convert the dry waste of Bangalore city into an electricity.	*CO3*	*PO1*	**10**

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