Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

Construction Engineering and Management

PX4012- Renewable Energy Technology

Regulations – 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	What are the environmental benefits of using renewable energy sources?	RE	1	2
2.	Explain the limitations of renewable energy sources?	UN	1	2
3.	What are the basic characteristics of solar radiation?	RE	2	2
4.	What is the equivalent circuit of a photovoltaic (PV) cell?	RE	2	2
5.	How would you determine the battery size required for a standalone PV system?	AP	3	2
6.	How does the angle of sunrays impact the performance of a solar collector?	UN	3	2
7.	How does wind speed impact the power curve of a wind turbine?	UN	4	2
8.	How is the power available in the wind calculated?	AP	4	2
9.	Compare the potential of wave energy and tidal energy in terms of energy generation.	UN	5	2
10.	How would you design a hybrid renewable energy system that integrates biomass and solar energy for a rural community?	AP	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Explain the significance of CO_2 emissions in the context of global warming and its relation to energy production.	UN	1	13
		Or			
	b	Examine renewable energy features and how they compare to conventional energy sources.	UN	1	13
12.	a	Analyze the basic characteristics of solar radiation and how it impacts the design of solar energy systems.	AN	2	13
		Or			
	b i	Explain the working principle of a photovoltaic cell.	UN	2	8
	ii	Identify how it converts solar energy into electrical energy.	AP	2	5

13.	a	i	Draw and explain the block diagram of a solar photovoltaic system.	AP	3	8
		ii	Discuss the role of each component in the PV system.	UN	3	5
			Or			
	b	i	Discuss the different types of inverters used in photovoltaic systems.	AP	3	6
		ii	How do you select the appropriate inverter for a given system?	UN	3	7
14.	a	i	Explain the origin of winds.	UN	4	6
		ii	Discuss the factors that determine the global and local wind patterns.	UN	4	7
			Or			
	b	i	Discuss the grid connection issues in wind energy systems.	UN	4	9
		ii	What are the challenges of integrating wind turbines into the electrical grid?	UN	4	4
15.	a	i	Discuss the various renewable energy sources such as ocean energy, biomass, and hydrogen.	UN	5	8
		ii	How do these sources contribute to sustainable energy systems?	UN	5	5
			Or			
	b	i	Discuss the role of fuel cells in renewable energy systems.	UN	5	8
		ii	How are they used to generate power from hydrogen?	UN	5	5

*PART – C (Marks 1*15 = 15)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
16.	a	i	List the features of renewable energy sources.	UN	1	7
		ii	Discuss their potential, achievements, and applications, especially in the Indian context.	UN	1	8
			Or			
	b	i	Explain the working principle and applications of tidal and wave energy systems.	UN	5	7
		ii	Elaborate these sources to meet the world's growing energy demand.	UN	5	8