

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fifth Semester**Chemical Engineering***CH3007 – Renewable Energy Resources***Regulations – 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	Define renewable energy and give two examples.	L1	1	2
2.	List two limitations of non-renewable energy sources.	L1	1	2
3.	Differentiate between Solar Thermal and Solar Photovoltaic systems.	L2	2	2
4.	State the principle of solar photovoltaic effect.	L1	2	2
5.	Define biomass gasifier and state its applications.	L1	3	2
6.	Mention the fuel properties of biogas.	L1	3	2
7.	Identify the environmental impacts of wind energy.	L2	4	2
8.	Assess the importance of tip-speed ratio in wind turbine design.	L2	4	2
9.	State any two merits of ocean thermal energy conversion.	L1	5	2
10.	Define wave power and write its basic equation.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain the historical evolution of energy consumption across civilizations.	L2	1	8
	ii Discuss the environmental challenges associated with energy use.	L2	1	8
	Or			
	b i Describe the quality, quantity, and availability of renewable energy sources in India.	L2	1	8
	ii Evaluate the role of renewable energy in achieving sustainability.	L2	1	8
12.	a i Explain the working principle of a flat plate solar collector with neat sketch.	L2	2	8
	ii Compare solar thermal and photovoltaic systems with neat sketches.	L2	2	8
	Or			
	b i Describe the working of a solar thermal power plant with neat sketches.	L2	2	8
	ii Describe the feasibility of solar PV for rural electrification.	L2	2	8

13.	a	i	Apply biomass gasification to design a small-scale gasifier system.	L3	3	8
		ii	Discuss the working and applications of a biomass gasifier.	L3	3	8
	Or					
	b	i	Analyze the factors influencing geothermal resource availability.	L3	3	8
ii		Create a layout for a geothermal power plant using binary cycle technology.	L3	3	8	
14.	a	i	Discuss the assessment methods of wind resources, and derive the expression for power extracted from wind.	L3	4	8
		ii	Analyze the performance characteristics of horizontal-axis wind turbines.	L3	4	8
	Or					
	b	i	Evaluate the environmental impact of large-scale wind farms.	L3	4	8
ii		Explain the applications of wind energy in rural electrification.	L3	4	8	
15.	a	i	Discuss the ocean energy potential in comparison with wind and solar.	L2	5	8
		ii	Explain the principles and working of tide energy technologies.	L2	5	8
	Or					
	b	i	Describe wave characteristics and different wave energy devices.	L2	5	8
ii		Describe ocean thermal energy conversion and osmotic power applications.	L2	5	8	