

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Discuss the classification of energy sources in detail, with examples and their significance for sustainable development.	13	K3	CO1
	(OR)			
b)	Explain the various forms of ocean energy and analyze their potential contribution to India's renewable energy mix.	13	K3	CO1
12. a)	Describe the major biochemical pathways involved in the biosynthesis and breakdown of carbohydrates.	13	K4	CO2
	(OR)			
b)	Outline the steps involved in the bioconversion of lignocellulosic feedstock to fermentable sugars.	13	K3	CO2
13. a)	Describe the theory of combustion, focusing on the 3 T's and different ignition processes.	13	K3	CO3
	(OR)			
b)	Explain gasification and co-gasification processes, with a focus on the chemical reactions involved.	13	K3	CO3
14. a)	Compare the performance and applications of flat-plate collectors and concentrating collectors.	13	K3	CO4
	(OR)			
b)	Elucidate the factors influencing flat-plate collector efficiency and suggest ways to improve it.	13	K3	CO4
15. a)	Discuss how optimization techniques improve the performance of renewable energy systems.	13	K3	CO5
	(OR)			
b)	Explain the role of computational software in system modeling and simulation. Compare two popular tools.	13	K4	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Evaluate the potential of large-scale photobioreactors for carbon capture and biofuel production. How could advancements in genetic engineering improve system efficiency?	15	K4	CO2
	(OR)			
b)	Propose a scalable process for the bioconversion of lignocellulosic feedstock to biofuels, addressing technical, economic, and environmental challenges.	15	K4	CO2