Reg. No										

AY 24

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

M.Tech. (First Semester – Regular/Supplementary) Examinations, January – 2026

24MPETE11011 – Renewable Energy System
(HPTE)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Define renewable energy and list any two major renewable energy sources used in India.	CO1	K1
b.	State the advantages of using solar hot water systems in domestic applications.	CO2	K4
c.	Distinguish between global winds and local winds.	CO3	K2
d.	Mention any three advantages of OTEC systems.	CO4	K2
e.	Write various advantages of tidal energy.	CO5	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Explain the working principle of a solar thermal energy system.	5	CO1	K1
b.	Describe how flat plate collectors are applied in solar water heating systems.	5	CO1	K4
	(OR)			
c.	Explain solar radiation components: beam, diffuse, and global radiation.	5	CO1	K2
d.	Describe the solar thermal energy conversion process.	5	CO1	K4
3.a.	What is a solar pond? Explain its basic working principle.	5	CO2	K1
b.	Why is convection suppressed in a non-convective solar pond? Explain briefly.	5	CO2	K4
	(OR)			
c.	Explain the need for thermal insulation in solar hot water storage tanks.	5	CO2	K2
d.	Differentiate between convective and non-convective solar ponds.	5	CO2	K4
4.a.	Explain the nature of wind and its role as a renewable source of energy.	5	CO3	K4
b.	Describe the origin and causes of wind formation in the atmosphere.	5	CO3	K2
	(OR)			
c.	Explain the concept of wind energy resources and their importance.	5	CO3	K2
d.	Describe the classification of wind energy resources based on wind speed.	5	CO3	K5
5.a.	Define Ocean Thermal Energy Conversion (OTEC) and state its basic working principle.	5	CO4	K3
b.	What is meant by ocean temperature difference? Why is it important for OTEC operation?	5	CO4	K4
	(OR)			
c.	Explain recent developments and future scope of OTEC.	5	CO4	K2
d.	Explain the fundamentals and formation of wave energy.	5	CO4	K2
6.a.	Explain the basic principle of tidal energy generation.	5	CO5	K2
b.	Explain the role of photosynthesis in biomass energy production.	5	CO6	K2
	(OR)			
c.	Explain the working of a tidal barrage system.	5	CO5	K2
d.	Describe biochemical conversion of biomass for energy generation.	5	CO6	K2

--- End of Paper ---