Reg. No										

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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MTEPE11011 – 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.	Explain the importance of Renewable Energy Sources.	CO1	K2
b.	Express the equation for the maximum output power (Pm) of wind turbine.	CO2	K2
c.	List the two important wind turbine generator installations in India.	CO3	K2
d.	Define Pitch angle.	CO4	K1
e.	Examine the working principle of pyranometer.	CO5	K1

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Analyze with neat sketch about the Ocean Thermal Energy Conversion (OTEC).	5	CO1	K1
b.	Summarize in detail about different types of hydro Electric Energy systems with neat diagram.	5	CO1	K1
	(OR)			
c.	Classify the various types of rotors used in the wind turbine.	5	CO1	K1
d.	What is Wind power and derive the equation of power in wind	5	CO2	K2
3.a.	Explain the construction and working of Vertical Axis Wind Turbine (VAWT).	5	CO2	K3
b.	Explain about the various types of Wind Power Plant (WPPs).	5	CO2	K1
	(OR)			
c.	Explain the in detail about the solar radiation phenomena.	5	CO3	K4
d.	Explain and derive expression for beam and diffuse radiation.	5	CO3	K5
4.a.	Explain the various types of Photo Voltaic (PV) Systems.	5	CO4	K6
b.	Explain in detail about the construction of solar cell, solar module, and solar array.	5	CO4	K4
	(OR)			
c.	Differentiate between the following methods of biogas generation. Pyrolysis & Combustion	5	CO4	K1
d.	Discuss the following methods of biogas generation. Gasification & Anaerobic Digestion	5	CO4	K2
5.a.	Explain the analysis of the energy content and its extraction for a hot dry rock type Geothermal resource.	5	CO5	K1
b.	With a neat sketch explain the operation impoundment hydro power plant.	5	CO5	K2
	(OR)			
c.	Discuss about the working operation of Photovoltaic (PV) system in series and parallel connections.	5	CO5	K1

d.	What are the reasons for variation in the amount of solar energy reaching earth surface.	5	CO5	K4
6.a.	Discuss in detail about the principle of Solar Photo Voltaic (SPV) conversion.	5	CO6	K5
b.	Explain the various types of Photo Voltaic (PV) Systems.	5	CO6	K6
	(OR)			
c.	With a neat sketch explain the operation impoundment hydro power plant.	5	CO6	K2
d.	Describe in detail the operation pumped storage hydro power plant.	5	CO6	K4

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