GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester Regular) Examinations, December – 2023

21BELPE35001 / 21BELPE35001 – Renewable Energy Sources

(EE & EEE)

Time: 3 hrs   Maximum: 70 Marks

(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.	Name various types of solar collectors. Which one gives superior performance?	CO1	K2
b.	Define cell, module and array.	CO1	K2
c.	What ranges of wind speed is considered favourable for wind power generation?	CO2	K1
d.	Explain the process of gasification of solid biofuels. What is the general composition of gas produced and what is its heating value? What are its main applications?	CO3	K1
e.	Explain the working principle of a hybrid electric vehicle with a schematic block diagram.	CO4	K1

PART – B   (15 x 4 = 60 Marks)

Answer **ALL** questions

		Marks	CO #	Blooms Level
2. a.	What is MPPT? Briefly explain the methods to implement MPPT system effectively .	10	CO1	K3
b.	Indicate the similarities between Distributed generation and Dispersed generation and explain the advantages of these technologies .	5	CO1	K2

(OR)

		Marks	CO #	Blooms Level
c.	Draw the equivalent circuit of Solar cell and obtain the expression for Open circuit voltage of Solar cell.	10	CO1	K3
d.	Briefly discuss about solar processes.	5	CO1	K2
3.a.	A wind speed of 10m/sec at the standard atmospheric pressure calculates i) The total power produced ii) the Actual power produced by a turbine of 100m diameter with an efficiency of 40%. Assume air density = 1.226 J/Kg/m^3, Betz limit of 0.593.	10	CO2	K3
b.	What are the advantages and disadvantages of wind power?	5	CO2	K1

(OR)

c.	Design the rotor radius of a multi blade wind turbine that operates in a wind speed of 36kmph to pump water at a rate of 6m3/hr. with a lift of 6m. Also calculate the angular velocity of the rotor. Given water density=1000 kg/m3; g = 9.8m/sec; water pump efficiency = 50%; efficiency of rotor to pump = 80%; CP = 0.3, λ = 1.0 and air density = 1.2 kg/m3.	10	CO2	K3
d.	Write short notes on: i) reactive power compensation of wind turbines, ii) wind power applications.	5	CO2	K2
4.a.	Explain the operating of Floating Drum and Fixed Dome biogas digesters with neat diagram.	10	CO3	K2
b.	Explain the process of gasification of solid bio-fuels. What are its main applications?	5	CO3	K1

<div align="center">(OR)</div>

c.	Explain the working principle of hybrid electric vehicle with schematic block diagram.	10	CO3	K1
d.	Explain the process of Combustion and its applications.	5	CO3	K2
5.a.	Write short note on i) Hydrogen fuel cells ii) MHD	10	CO4	K1
b.	What is the need of hybrid systems? Explain any one hybrid system process with neat diagram .	5	CO4	K1

<div align="center">(OR)</div>

c.	Explain the Case study of Biomass-Diesel with neat diagram.	10	CO4	K1
d.	Explain the schematic arrangement of hydroelectric power station.	5	CO4	K1

<div align="center">--- End of Paper ---</div>