Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160917 **Date: 28-05-2025**

Subject Name: Wind And Solar Energy

Time: 10:30 AM TO 01:00 PM **Total Marks:70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	List the types of generator used in wind power plant.	**03**
	(b)	Write Betz Law and mention betz limit value in case of wind turbine.	**04**
	(c)	Explain Converter control techniques in case of Wind power.	**07**
Q.2	**(a)**	Define Cut in speed, Cut out speed and Tip speed ratio	**03**
	(b)	Write short note on DFIG type of Wind Generator.	**04**
	(c)	Classify and Explain Fixed and Variable speed wind turbines	**07**
		OR	
	(c)	List out various solar thermal applications & explain any one in detail.	**07**
Q.3	**(a)**	Write the short note on battery sizing.	**03**
	(b)	List the advantage and limitation of Solar Energy.	**04**
	(c)	What is Maximum Power Point Tracking (MPPT) system? & Explain P & O algorithm to track maximum power from solar PV System.	**07**
		OR	
Q.3	**(a)**	Explain the concept of central receiver.	**03**
	(b)	Write short note on box type solar cooker.	**04**
	(c)	Draw & explain the I-V and P-V characteristics of Solar cell.	**07**
Q.4	**(a)**	Define : (i) Solar Azimuth Angle, (ii) Zenith Angle, (iii) Hour Angle	**03**
	(b)	Explain solar passive heating and cooling system.	**04**
	(c)	Explain solar Refrigeration and Air conditioning System.	**07**
		OR	
Q.4	**(a)**	Explain solar cell, module and array.	**03**
	(b)	Explain stall control & pitch control of wind power.	**04**
	(c)	Explain the importance & working of solar water pump.	**07**
Q.5	**(a)**	Define air mass & explain it.	**03**
	(b)	Differentiate Grid-Connected System and Standalone system	**04**
	(c)	Explain the modeling of elements in hybrid PV-wind system briefly.	**07**
		OR	
Q.5	**(a)**	Describe various types of power quality issues.	**03**
	(b)	What are the grid code technical requirements?	**04**
	(c)	Classify the solar thermal collectors. Explain the construction & working of solar flat plate collector.	**07**

****