Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160917 Date:22-05-2024

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)**	Define Tip speed ratio, stall and pitch control for wind turbine	**03**
	(b)	Mention Power electronics converter role in wind power	**04**
	(c)	Write Short note on modern wind turbine technologies	**07**
Q.2	**(a)**	List the Advantages of Permanent Magnet Synchronous Generators (PMSG) use for wind power	**03**
	(b)	Explain Betz Law with Betz limit value for wind turbine	**04**
	(c)	Define various solar angles and their effects on the collection of solar radiation on a titled flat surface	**07**
		OR	
	(c)	Describe about solar radiation data.	**07**
Q.3	**(a)**	Define following terms in case of solar energy: i) Altitude angle ii) Zenith angle iii) Clearness Index	**03**
	(b)	Explain measurements of solar radiation	**04**
	(c)	Explain working of Doubly-Fed Induction Generators with its characteristics	**07**
		OR	
Q.3	**(a)**	Classify Fixed and Variable speed wind turbines	**03**
	(b)	Draw and explain V-I characteristics of a PV cell.	**04**
	(c)	Give Comparison of monocrystalline, polycrystalline and thin film type solar module.	**07**
Q.4	**(a)**	What is voltage and frequency operating limits on integration of solar and wind system	**03**
	(b)	Write applications of Solar PV Power	**04**
	(c)	Write Short Note on solar Street Light	**07**
		OR	
Q.4	**(a)**	What is Standalone solar system? Where it can be installed?	**03**
	(b)	What are the Power quality issues occurring during integration of solar –wind with grid.	**04**
	(c)	Explain working of Solar thermal power generation plant	**07**
Q.5	**(a)**	Give the types of solar collector	**03**
	(b)	Explain limitation of solar energy	**04**
	(c)	Write technical note on Solar Air Conditioning	**07**

OR

Q.5	**(a)**	What is Maximum Power Point Tracking (MPPT)?	**03**
	(b)	Describe Solar water heating plant shortly	**04**
	(c)	Explain PV and wind farm behavior during grid disturbances	**07**

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