Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma Engineering - SEMESTER–V • Examination – WINTER • 2014

Subject Code: 3350905 **Date: 06-12-2014**

Subject Name: Wind and Solar Energy Systems

Time: 10:30 am - 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. **English version is considered to be Authentic.**

Q.1		Answer any seven out of ten.	**14**
	1.	Draw Block diagram of wind power plant.	
	2.	Draw Block diagram of STATCOM.	
	3.	Draw Block diagram of UPQC.	
	4.	Give Classification of Variable Speed Wind Power Plant.	
	5.	Explain working principle of Doubly fed Induction Generator.	
	6.	Explain working principle of type C Wind Power Plant.	
	7.	Give Classification of Solar Energy Collector.	
	8.	Explain Voltage Quality.	
	9.	Explain Wind Energy penetration.	
	10.	Define Voltage Slag and Voltage Swell.	
Q.2	(a)	Why Reactive Power compensation required in type A wind power plant?	**03**
		OR	
	(a)	Explain Compensation of Reactive Power by Capacitor Bank.	**03**
	(b)	Explain Working Principle of type A wind power plant.	**03**
		OR	
	(b)	Explain Topologies of type A wind power plant.	**03**
	(c)	Explain Stator and Rotor for Squirrel Cage Induction Generator.	**04**
		OR	
	(c)	State and Explain Methods of starting type A wind power plant.	**04**
	(d)	Explain Static Voltage Compensator.	**04**
		OR	
	(d)	Explain Maintenance of type A wind power plant.	**04**
Q.3	(a)	Explain Requirement of Back to Back Electronic Converter in Wind Power Plant.	**03**
		OR	
	(a)	Explain Topology of type D Wind Power Plant.	**03**
	(b)	Explain Construction of 4 poles Wound Rotor Synchronous Generator.	**03**
		OR	
	(b)	Explain Schematic Arrangement and Working of Geared type D Wind Power Plant using Permanent Magnet Synchronous Generator.	**03**
	(c)	Compare Conventional Geared Wind Power Plant and Hydro Dynamic Wind Power Plant.	**04**
		OR	
	(c)	Explain Features and Limitations of Direct Drive type D Wind Power Plant.	**04**
	(d)	Explain Maintenance of type C and type D Wind Power Plant.	**04**
		OR	
	(d)	State and Explain Elements of Low temperature Thermal Power Plant using Solar Panel.	**04**
Q.4	(a)	Explain Measures to Improve Solar Photo Voltaic Power Quality.	**03**

OR

	(a)	Explain Node voltage and branch flow as local impact of wind power.	**03**
	(b)	Explain Grid connection of solar Photo Voltaic Power Plant.	**04**

OR

	(b)	Explain Short term balancing with respect to grid connection of wind power plant.	**04**
	(c)	Explain Wind Solar Hybrid system and its maintenance.	**07**
Q.5	(a)	Explain Maintenance of Concentrated Solar Power Plant.	**04**
	(b)	Explain Advantages and Disadvantages of Solar Photo Voltaic System.	**04**
	(c)	Compare Lead-acid Battery and Nickel-cadmium Battery.	**03**
	(d)	Explain Power system stability and Wind power plant.	**03**

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