Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – WINTER • 2014

Subject Code: 182401 **Date: 04-12-2014**

Subject Name: Power Electronics Application in Power System

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Enlist the advantages of static relays over electromagnetic relays. Also specify the limitation of static relays. **07**

(b) Fill in the blanks with appropriate options given below. **07**

[1] Solar energy is an _____ non-conventional renewable power resource.

(A) eternal (B) everlasting (C) unchangeable (D) all of the above

[2] _____ is used for interior and exterior installation of solar power plant.

(A) low frequency inverter (B) medium frequency inverter

(C) high frequency string inverter (D) none of the above

[3]Photovoltaic Cell (PV) comprises of _____.

(A) copper, indium and selenide (CIS)

(B) germanium, indium and silicon (GIS)

(C) cadmium, indium and silver (CIS)

(D) germanium, indium and silver (GIS)

[4]Interconnection of Renewable Energy Source to utility grid is done through _____.

(A) power transformer (B) isolation transformer

(C) either (A) or (B) (D) none of the above

[5] FACTS technology has advanced the transmission system on such an extent that the _____.

(A) same line is used for bidirectional power transmission

(B) power factor remains unity at any point on the transmission network

(C) both (A) and (B) (D) none of the above

[6] As compared to numerical relays, static relays do not have the feature of _____.

(A) no moving parts (B) flexibility due to programming approach

(C) low burden (D) miniaturization

[7] The component used in the output circuit of the static relay is _____.

(A) op-amp (B) comparator (C) capacitor (D) thyrister

Q.2 **(a)** Draw and explain block diagram for Interconnection of renewable energy source to utility grid. **07**

(b) Draw block diagram for static distance relay and explain drawing various waveforms seen at the output of each block. **07**

OR

(b) Draw and explain Interconnection of Wind power plant to utility grid. **07**

Q.3 Discuss on Improved single-phase utility Interface. **14**

OR

Q.3 Discuss on interface for a bidirectional power flow. **14**

Q.4	**(a)**	Explain the operation of SVC.	**07**
	(b)	Explain the operation of TCR.	**07**
		OR	
Q.4	**(a)**	Explain the operation of STATCOM.	**07**
	(b)	Explain the operation of TSC.	**07**
Q.5	**(a)**	Discuss on various possible HVDC configurations employed in the transmission system.	**07**
	(b)	Discuss on the various types of FACTS - controller and its advantages.	**07**
		OR	
Q.5	**(a)**	Summarize the application of power electronics on the pavement of HVDC – Transmission on Indian - grid.	**07**
	(b)	Explain typical converter system used in HVDC transmission.	**07**

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