Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2014

Subject Code: 180907 **Date: 27-05-2014**

Subject Name: Advanced Power Electronics-II

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.**

Q.1	**(a)**	State types of HVDC systems and explain each in brief.	**07**
	(b)	Define FACTs systems and state its possible benefits in Emerging Transmission Network.	**07**
Q.2	**(a)**	Showing well labeled figure, explain the combined converter characteristics of the HVDC system. Explain each part of Characteristics.	**07**
	(b)	Explain basic principle of shunt compensation used for transmission line. How it is useful to improve performance of system.	**07**
		OR	
	(b)	Explain basic principle of series compensation used for transmission line. How it is useful to improve performance of system.	**07**
Q.3	**(a)**	Explain working of Synchronous Condensor. How same type of compensation can be achieved by using STATCOM. Explain working of STATCOM.	**07**
	(b)	Giving circuit diagram, explain the working of combined TSC-TCR compensator circuit. Draw its steady state voltage – reactive power characteristics.	**07**
		OR	
Q.3	**(a)**	Draw the circuit diagram and explain the working of Static Synchronous Series Compensator (SSSC).	**07**
	(b)	Draw the circuit diagram and explain the working of Thyristorised Controlled Reactor (TCR).	**07**
Q.4	**(a)**	Explain effect of overlap angle on the performance line commutated converter. Also discuss the parameters, on which overlap angle depends.	**07**
	(b)	Stating basic assumptions, derive the output DC voltage equation for 6-pulse line commutated converter. Also prove that power factor of converter is proportional to cosine of firing angle.	**07**
		OR	
Q.4	**(a)**	Explain basic requirements of firing circuits used in HVDC system. Also explain types of firing schemes used in HVDC system.	**07**
	(b)	Giving block diagram, explain working of Power Controller.	**07**
Q.5	**(a)**	Explain the working of Voltage Source Converter operation and its principle.	**07**
	(b)	Showing circuit diagram, explain working of Unified Power Flow Controller (UPFC).	**07**
		OR	
Q.5	**(a)**	Showing block diagram, explain working of Constant Extinction Angel Controller used in Converter Control of HVDC system.	**07**
	(b)	Compare the performance of static compensators TCR and TSC.	**07**

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