Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 170905 **Date: 29-11-2014**

Subject Name: Advanced Power systems - I

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.**

Q.1	**(a)**	Explain basic speed-governing system and supplementary control system for automatic generation control.	**07**
	(b)	Discuss the different types of HVDC Links with neat sketch.	**07**
Q.2	**(a)**	Explain power reversal characteristics and its correction to inverter characteristics for a DC link.	**07**
	(b)	Explain load compensation and system compensation with vector diagram.	**07**
		OR	
	(b)	What is the requirement of reactive power in a transmission system? Compare series and shunt compensation.	**07**
Q.3	**(a)**	Draw and explain the operating characteristics of a TCR without voltage control and with voltage control.	**07**
	(b)	Discuss the applications of synchronous condensers.	**07**
		OR	
Q.3	**(a)**	Provide comparison of different reactive compensators in terms of: Control range, Nature of Control, Response Time, Harmonic Generation and Losses.	**07**
	(b)	Explain transformer tap changer control in conventional control mechanism.	**07**
Q.4	**(a)**	Compare ac and dc transmission in terms of economics of transmission and technical performance.	**07**
	(b)	Draw a neat diagram for two level and three level voltage source converters. Explain each component.	**07**
		OR	
Q.4	**(a)**	Draw the diagram of 12-pulse converter for the ac voltage of the lower bridge lags that of the upper by 30° electrical. Sketch its AC current waveforms. Give Peak inverse Voltage and Peak to Peak ripple for 12 pulse converter.	**07**
	(b)	Give comparison between Classical HVDC and HVDC-VSC.	**07**
Q.5	**(a)**	Explain the hierarchical control scheme for a DC link.	**07**
	(b)	Explain sources of harmonics in HVDC system.	**07**
		OR	
Q.5	**(a)**	Explain the operation of pulse frequency control.	**07**
	(b)	What do you understand by extinction angle control? What are its limitations under asymmetrical fault?	**07**

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