Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:180907 **Date:12/12/2015**

Subject Name: Advanced Power Electronics-II

Time: 2:30pm to 5:00pm **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)**	Derive equation showing effect of series compensation on power transfer capability of transmission line. State advantages and limitations of series compensation over shunt compensation.	**07**
	(b)	Discuss the Merits and demerits of the HVDC transmission line over HVAC transmission line.	**07**
Q.2	**(a)**	Explain load compensation and system compensation with the help of phasor diagram**.**	**07**
	(b)	Give brief comparison of different SVCs.	**07**
		OR	
	(b)	With necessary assumptions derive the DC output voltage equation for 6-pulse line commutated converter. Also prove that displacement factor of converter is proportional to cosine of firing angle ($\cos\Phi = \cos\alpha$).	**07**
Q.3	**(a)**	Explain working of TCR. Derive the expression for susceptance of TCR.	**07**
	(b)	State & discuss the factors to be given due care while designing the Shunt & Series compensators.	**07**
		OR	
Q.3	**(a)**	Give the schematic diagram of the 12-pulse converter. State its advantages over 6-pulse converter.	**07**
	(b)	Explain the working of TSC-TCR.	**07**
Q.4	**(a)**	Compare Mechanically switched capacitor (MSC) with Thyristor switched capacitor (TSC).	**07**
	(b)	Draw the typical HVDC transmission scheme and explain the equipments required for HVDC system.	**07**
		OR	
Q.4	**(a)**	Discuss inverter extinction angle control (EAG) in brief.	**07**
	(b)	Derive the equation of reactive power and discuss why it is necessary to have reactive power compensation.	**07**
Q.5	**(a)**	Explain Thyristor Controlled Transformer (TCT) compensator.	**07**
	(b)	Discuss advantages of FACTS devices.	**07**
		OR	
Q.5	**(a)**	Explain the characteristics of FC-TCR with and without coupling transformer.	**07**
	(b)	Draw the equivalent circuit HVDC transmission system with necessary equations and also discuss its operating characteristics in brief.	**07**

****