Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II Examination July 2010

Subject code: 720707

Subject Name: Flexible AC Transmission Systems

Date:08 / 07 /2010 **Time: 11.00am – 1.30pm**

Total Marks: 60

Instructions:

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

Q.1	**(a)**	Discuss principles of operations and V-I characteristics of STATCOM with suitable power circuit diagram.	**06**
	(b)	With neat power circuit diagram and waveforms describe the principle and working of Elementary 6 pulse voltage source converter type STATCOM.	**06**
Q.2	**(a)**	Define STATCOM. Describe Selective Harmonics Elimination Modulation (SHEM) technique using 3 levels BVSI STATCOM.	**06**
	(b)	Describe the comparative evaluation of various FACT Controllers considering the different aspects like capabilities and performance.	**06**
		OR	
	(b)	Discuss the benefit of SVC applications in HVDC transmission system	**06**
Q.3	**(a)**	Describe Unified Power Flow Controller (UPFC) principle of operation and it's implementation using back to back VSCs with necessary line diagram.	**06**
	(b)	Discuss the configuration of Thyristor Switch Capacitor Thyristor controlled reactor (TSC-TCR) SVC and obtain the current characteristics.	**06**
		OR	
Q.3	**(a)**	Describe in brief the use of Static Var Compensators (SVC) as a Voltage Regulator..	**06**
	(b)	Draw TCSC controller module and explain it's basic principle.	**06**
Q.4	**(a)**	Explain modeling of SVC for load flow studies considering SVC operations within and outside the control range.	**06**
	(b)	Enumerates advantages and areas of applications of STATCOM related to power system.	**06**
		OR	
Q.4	**(a)**	Describe in brief the Thyristor controlled transformer (TCT) with it's various arrangements.	**06**
	(b)	Give a comparison of different SVCS.	**06**
Q.5	**(a)**	What is Compensation of transmission line? Discuss the series compensation and it's effect on short, symmetrical transmission line with suitable phasor diagram.	**06**
	(b)	With the help of single line diagram explain TCR compensator with fixed shunt capacitor.	**06**
		OR	
Q.5	**(a)**	Describe the applications of SSSC as Power flow controller and SSR mitigation.	**06**
	(b)	Describe 3 phase star connected 3 levels Binary Voltage source inverter (BVSI) based STATCOM illustrating various voltage levels.	**06**

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