Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2720716 **Date: 27/05/2016**

Subject Name: FACTS

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)**	Which are the conventional control mechanisms for active and reactive power control? Explain them in brief.	**07**
	(b)	What is reactive power compensation? Explain in brief Line and Load compensation.	**07**
Q.2	**(a)**	Explain the advantages of FACTS in brief.	**07**
	(b)	Explain the Midpoint compensation and also derive the equation of voltage at mid point.	**07**
		OR	
	(b)	Explain Static Voltage Compensator (SVC) in detail.	**07**
Q.3	**(a)**	Explain the working of Thyristor Controlled Reactor (TCR) with suitable diagram. Also draw the voltage and current wave form for different firing angles.	**07**
	(b)	Write a short note on TSC-TCR.	**07**
		OR	
Q.3	**(a)**	Explain the working of TSC along with its V-I characteristics and waveforms.	**07**
	(b)	Explain the schematic diagram and working principle of a STATCOM.	**07**
Q.4	**(a)**	Discuss the application of SSSC as an active power controller. Draw and discuss the necessary control circuit.	**07**
	(b)	Explain the construction and working of a Unified Power Flow Controller (UPFC).	**07**
		OR	
Q.4	**(a)**	Mention the modes of operation of a TCSC. Describe the Vernier Capacitive mode of operation in detail with steady state waveforms of voltages and currents.	**07**
	(b)	Discuss how Sub synchronous Resonance (SSR) is mitigated using SVC.	**07**
Q.5	**(a)**	Explain how SVC is going to improve transient stability.	**07**
	(b)	Mention the advantages of having slope in the dynamic characteristics of an SVC.	**07**
		OR	
Q.5	**(a)**	Explain the parallel operation of two SVC's for load sharing for both the conditions i.e. with and without current droop.	**07**
	(b)	How is the third harmonic distortion possible using SVC voltage control?	**07**

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