Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2734501 **Date:03/05/2016**

Subject Name: Application of Power Electronics to Power System

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)**	Draw and explain dynamic V-I characteristics of SVC and voltage-reactive power characteristic of SVC.	**07**
	(b)	With the help of circuit and phasor diagram explain system compensation and load compensation.	**07**
Q.2	**(a)**	Explain load sharing between parallel connected SVCs with diagram.	**07**
	(b)	Write a short note on synchronous condenser.	**07**
		OR	
	(b)	Briefly describe the working of a Thyristor Controlled Transformer (TCT).	**07**
Q.3	**(a)**	Giving circuit diagram, explain the working of series active filters. Also discuss the algorithm used to generate compensated voltage signals.	**07**
	(b)	Explain briefly operation of Thyristor Switched Capacitor (TSC).	**07**
		OR	
Q.3	**(a)**	Explain briefly operation of Thyristor Controlled Rectifier (TCR).	**07**
	(b)	Explain working of shunt active filter for constant power compensation. Draw the block diagram for constant instantaneous power control strategy and explain its working.	**07**
Q.4	**(a)**	Discuss the reduction in the SVC reactive power rating by current slope.	**07**
	(b)	Discuss the role of SVC as a voltage regulator with diagram.	**07**
		OR	
Q.4	**(a)**	Discuss the role of SVC as a voltage controller with diagram.	**07**
	(b)	Draw and explain reactance (X_{TCSC}) Vs thyristor firing delay angle (α) characteristics of TCSC.	**07**
Q.5	**(a)**	Explain principle of operation of UPFC with relevant phasor diagram and describe its implementation using back to back VSCs with schematic diagram.	**07**
	(b)	Explain with the help of suitable diagram working principle of STATCOM and it V-I characteristic.	**07**
		OR	
Q.5	**(a)**	Explain the principle of operation of Static Synchronous Series Capacitor (SSSC) scheme.	**07**
	(b)	Explain the application of STATCOM for improving transient stability of a power system.	**07**

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