Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER III (NEW) – EXAMINATION – WINTER-2016

Subject Code: 2734501 **Date:25/10/2016**

Subject Name: Application to power Electronics to power System

Time:02:30 pm to 05:00 pm **Total Marks: 70**

Instructions:

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

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Q.1	(a)	Give classification of FACTS devices and their advantages.	07
	(b)	Derive an expression for mid-point voltage of a symmetrical lossless transmission line as a function of power flow on it.	07
Q.2	(a)	Explain load compensation and system compensation.	07
	(b)	Give comparison of shunt and series connected capacitor.	07
		OR	
	(b)	Explain configuration and operating characteristics of Synchronous condensers.	07
Q.3	(a)	Explain operation of TSC-TCR with its characteristic.	07
	(b)	Explain role of SVC as voltage regulator.	07
		OR	
Q.3	(a)	Discuss Modelling of SVC.	07
	(b)	Explain voltage control by the SVC.	07
Q.4	(a)	Explain operation of Thyristor-Controlled Series Capacitor (TCSC) in following modes: Bypassed Thyristor, Blocked Thyristor, Partially conducting Thyristor.	07
	(b)	Explain operation of FC-TCR with its characteristics.	07
		OR	
Q.4	(a)	Explain three phase six pulse VSC-STATCOM with circuit diagram and waveform.	07
	(b)	Draw and explain compensating voltage Vs line current and compensating reactance Vs line current characteristics of TCSC in voltage control mode.	07
Q.5	(a)	Explain the construction and working of IPFC.	07
	(b)	With circuit diagram explain the working of series active filters.	07
		OR	
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 compensation principle of hybrid filter with necessary equations.	07

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