Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1720707 **Date: 14/12/2015**

Subject Name: Flexible AC Transmission System

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

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

Q1. A.	Discuss the concept of series reactive compensation. How does the degree of series compensation affect the active and reactive power flow.	07
Q1. B.	Explain how the power flow in a line can be controlled by controlling the magnitude and polarity of the quadrature voltage injected in series with the line.	07
Q2. A.	Explain functioning of a TCR (Thyristor Controlled Reactor). Draw the waveforms with and without delay in the firing angle control. Hence show the V-I area of the TCR.	07
Q2. B.	Explain the implementation of the Unified Power Flow Controller (UPFC) using two back to back voltage source converters.	07
	OR	
Q2. B.	Draw the schematic and equivalent circuit of an SSSC (Static Synchronous Series Compensator). How is the control of power flow attained using it.	07
Q3. A.	Explain functioning of an SVC as a voltage regulator.	07
Q3. B.	Enumerate various advantages of the STATCOM over an SVC. What are its applications.	07
	OR	
Q3. A.	Discuss mitigation of Subsynchronous Resonance (SSR) using SVC.	07
Q3. B.	Explain the principle of operation of a STATCOM along with its steady state control characteristics.	07
Q4. A.	Discuss the operation of the TSC (Thyristor switched capacitor). What care should be taken so as to get transient free switching.	07
Q4. B.	How is enhancement in voltage and transient stability attained using shunt reactive compensation.	07
	OR	

Q4. A.	What are the benefits of SVC applications in HVDC transmission system.	07
Q4. B.	How does a TSSC (Thyristor Switched Series Capacitor) control the flow of power in a line. What are the problems encountered in its operation.	07
Q5. A.	Discuss modeling of a TCSC (Thyristor Controlled Series Capacitor) for stability studies.	07
Q5. B.	Explain constant current (CC) and constant angle (CA) control characteristics of a TCSC.	07

OR

Q5. A.	Discuss operation of a TSC-TCR type var generator with its var demand versus var output characteristics. Also explain its functional control scheme.	07
Q5. B.	Give a list of possible benefits in a power system using FACTS technology.	07

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