

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2014

Subject code: 1720707

Date: 05-12-2014

Subject Name: Flexible AC Transmission System

Time: 02:30 pm - 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.

- Q.1 (a) What are conventional voltage control mechanisms? Explain any one of them. 07
- (b) Explain the working of a Thyristor Controller Reactor (TCR), showing all operating waveforms with firing delay angle control. 07
- Q.2 (a) Explain principle of operation of a UPFC (Unified Power flow Controller) and its implementation using back to back VSC's. 07
- (b) How does a phase shifting transformer help in FACTS technology? 07
- OR
- (b) Discuss mid-point shunt compensation on a transmission line. 07
- Q.3 (a) Explain parallel operation of two SVC's for load sharing for both the cases i.e. with and without current droop. 07
- (b) Discuss operation of a Thyristor switched capacitor (TSC) showing associated waveforms and hence show its V-I characteristic. 07
- OR
- Q.3 (a) How does a basic TSC-TCR type static var generator help in controlling the VAR demand by switching the capacitor banks in and out within one cycle of the applied voltage. 07
- (b) Explain use of an SVC as a voltage regulator. 07
- Q.4 (a) Explain how an SSSC is used as a power flow controller and how SSR mitigation is attained using it. 07
- (b) Discuss advantages of a STATCOM. Also list its areas of application. 07
- OR
- Q.4 (a) Discuss the principle of operation and V-I characteristic of a STATCOM with its power circuit diagram. 07
- (b) Explain with basic operating circuit, the operating principle of a TSSC. 07
- Q.5 (a) Prove as to how series compensation in a line increases the active and reactive power transfer capability of the line. 07
- (b) Discuss the inductive vernier control mode for a TCSC. 07
- OR
- Q.5 (a) How is enhancement in transient stability margin attained using an SVC. 07
- (b) Discuss operation of an FC-TCR. 07
