

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER 2013****Subject Code: 170905****Date: 03-12-2013****Subject Name: Advanced Power systems-I****Time: 10:30 TO 01:00****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) List out the conventional real and reactive power flow control methods in transmission systems. Explain automatic generation control in detail. **07**
- (b) Explain the classification of FACT controllers based on their connection in the power systems. Explain how steady state stability limit can be improved by using it. **07**
- Q.2** (a) Draw & Explain (i) Suceptance characteristics & (ii) V-I characteristic of Thyristor control reactor(TCR) **07**
- (b) Explain midpoint compensation & prove that by mid point compensation the power transfer capability of a transmission line can be doubled. **07**
- OR**
- (b) What is reactive power compensation? Explain system compensation & load compensation for a transmission system. **07**
- Q.3** (a) Sketch the single line diagram of FC- TCR & explain its operating characteristic **07**
- (b) Explain distributed parameter modeling of long transmission line. **07**
- OR**
- Q.3** (a) Explain the comparison between different types of SVC's **07**
- (b) Explain TSC-TCR & Explain it's operating characteristic **07**
- Q.4** (a) Explain various types of links used in HVDC systems with necessary diagrams. **07**
- (b) Discuss the advantages of HVDC systems. **07**
- OR**
- Q.4** (a) Derive the equivalent circuit of TSC and draw its waveform for transient free switching. **07**
- (b) Derive the expressions for real and reactive power flow (P_{12} and Q_{12} between the two buses 1 and 2 connected by a transmission line. **07**
- Q.5** (a) What is the importance of harmonics study? & Explain the sources of harmonics generation in brief **07**
- (b) Explain the selection methods of power control in HVDC System **07**
- OR**
- Q.5** (a) Discuss the applications of HVDC systems **07**
- (b) Explain 6 pulse converter used in HVDC system with necessary waveforms **07**
