

GUJARAT TECHNOLOGICAL UNIVERSITYM. E. Sem. – IInd - Examination – June/July- 2011

Subject code: 1720707

Subject Name: Flexible AC Transmission System

Date: 29/06/2011

Time: 10:30 am – 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) Explain the Constant Current (CC) control with the help of controller circuit diagram and control characteristic for the closed loop control of TCSC. **07**
- (b) Explain the significance of different control modes of TCSC operation. Discuss Capacitive-Vernier Control and Inductive-Vernier Control mode for TCSC. **07**
- Q.2** (a) Discuss V-I characteristic of STATCOM. Explain the phenomena of power exchange between STATCOM and an AC system connected to it. **07**
- (b) Consider closed loop control and clearly mention the objective of Constant Angle (CA) control of TCSC using control characteristic. **07**
- OR**
- (b) Explain Variable Reactance Model of a TCSC. **07**
- Q.3** (a) Explain operating characteristic of a TCR without voltage control and discuss the applications of V-I, Susceptance and Current characteristics of it. **07**
- (b) What is the objective of closed loop control of TCR? Discuss in detail. **07**
- OR**
- Q.3** (a) Explain TSC along with its operating characteristic. **07**
- (b) Describe the analysis of current transients when an ideal ac voltage source is connected to a capacitor through a bidirectional thyristor switch. **07**
- Q.4** (a) What is Gain Time Constant and the Integrator Current Droop form related with the modeling of voltage regulator for TSC-TCR type of SVC. **07**
- (b) Discuss the influence of SVC on the system voltage to which it is connected through coupling transformer. **07**
- OR**
- Q.4** (a) Explain the parallel operation of two SVC's for load sharing by considering both cases, with and without Current Droop. **07**
- (b) Mention the advantages of having slope in the dynamic characteristic of SVC. **07**
- Q.5** (a) Give Classification of compensators by function and type. **07**
- (b) Define harmonics. Discuss its effect on rotating machines, transformer, cables, power factor correction capacitors and electronic equipments. **07**
- OR**
- Q.5** (a) Enumerate the features of an Ideal compensator. **07**
- (b) Give classification of FACTS controller in detail and mention the benefits when applied under steady state and dynamic conditions of power system. **07**
