

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII EXAMINATION – SUMMER 2016****Subject Code:170905****Date:05/05/2016****Subject Name:Advanced Power System - I (Department Elective - I)****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.

- Q.1** (a) What is AGC? How primary and secondary control in AGC works also explain transformer tap changer control. **07**
- (b) What is synchronous condenser? What are its applications? **07**
- Q.2** (a) Explain load compensation and system compensation with the help of phasor diagram. **07**
- (b) Compare different SVCs. **07**
- OR**
- (b) Explain working of TCR draw wave forms of voltage and current for different values of  $\alpha$ . **07**
- Q.3** (a) What are the advantages offered by FACTS devices? **07**
- (b) Explain the MSC-TCR. **07**
- OR**
- Q.3** (a) Explain conduction sequence in 6-pulse converter configuration. **07**
- (b) Write a short note on 12-pulse converter. **07**
- Q.4** (a) Compare HVDC power transmission with current source converter (CSC) and voltage source converter (VSC). **07**
- (b) State advantages of HVDC transmission over EHVAC transmission for bulk power transmission. **07**
- OR**
- Q.4** (a) What are the requirements of an ideal control system for HVDC link? Draw and explain the diagram of hierarchical control scheme for a HVDC link. **07**
- (b) Discuss operation, characteristics, features of IGBT with symbol and equivalent circuit. What are the advantages of IGBTs SCRs for HVDC converters? **07**
- Q.5** (a) Discuss features, advantages and application of an HVDC-VSC system with single line diagram. **07**
- (b) What is the importance of harmonic study in HVDC system? How the harmonics are generated by transformers and converters? **07**
- OR**
- Q.5** (a) With neat schematic diagram, state the various apparatus required for HVDC station and explain purpose of each. **07**
- (b) For 6-pulse converter derive equivalent circuit for rectifier and inverter for an HVDC power transmission system with usual expressions. **07**

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