

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 170905****Date: 29-11-2014****Subject Name: Advanced Power systems - I****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 basic speed-governing system and supplementary control system for automatic generation control. **07**
- (b)** Discuss the different types of HVDC Links with neat sketch. **07**
- Q.2 (a)** Explain power reversal characteristics and its correction to inverter characteristics for a DC link. **07**
- (b)** Explain load compensation and system compensation with vector diagram. **07**
- OR**
- (b)** What is the requirement of reactive power in a transmission system? Compare series and shunt compensation. **07**
- Q.3 (a)** Draw and explain the operating characteristics of a TCR without voltage control and with voltage control. **07**
- (b)** Discuss the applications of synchronous condensers. **07**
- OR**
- Q.3 (a)** Provide comparison of different reactive compensators in terms of: Control range, Nature of Control, Response Time, Harmonic Generation and Losses. **07**
- (b)** Explain transformer tap changer control in conventional control mechanism. **07**
- Q.4 (a)** Compare ac and dc transmission in terms of economics of transmission and technical performance. **07**
- (b)** Draw a neat diagram for two level and three level voltage source converters. Explain each component. **07**
- OR**
- Q.4 (a)** Draw the diagram of 12-pulse converter for the ac voltage of the lower bridge lags that of the upper by 30° electrical. Sketch its AC current waveforms. Give Peak inverse Voltage and Peak to Peak ripple for 12 pulse converter. **07**
- (b)** Give comparison between Classical HVDC and HVDC-VSC. **07**
- Q.5 (a)** Explain the hierarchical control scheme for a DC link. **07**
- (b)** Explain sources of harmonics in HVDC system. **07**
- OR**
- Q.5 (a)** Explain the operation of pulse frequency control. **07**
- (b)** What do you understand by extinction angle control? What are its limitations under asymmetrical fault? **07**
