

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER 2014****Subject Code: 180907****Date: 27-05-2014****Subject Name: Advanced Power Electronics-II****Time: 10:30 am TO 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) State types of HVDC systems and explain each in brief. **07**
(b) Define FACTS systems and state its possible benefits in Emerging Transmission Network. **07**
- Q.2** (a) Showing well labeled figure, explain the combined converter characteristics of the HVDC system. Explain each part of Characteristics. **07**
(b) Explain basic principle of shunt compensation used for transmission line. How it is useful to improve performance of system. **07**
- OR**
- (b) Explain basic principle of series compensation used for transmission line. How it is useful to improve performance of system. **07**
- Q.3** (a) Explain working of Synchronous Condensor. How same type of compensation can be achieved by using STATCOM. Explain working of STATCOM. **07**
(b) Giving circuit diagram, explain the working of combined TSC-TCR compensator circuit. Draw its steady state voltage – reactive power characteristics. **07**
- OR**
- Q.3** (a) Draw the circuit diagram and explain the working of Static Synchronous Series Compensator (SSSC). **07**
(b) Draw the circuit diagram and explain the working of Thyristorised Controlled Reactor (TCR). **07**
- Q.4** (a) Explain effect of overlap angle on the performance line commutated converter. Also discuss the parameters, on which overlap angle depends. **07**
(b) Stating basic assumptions, derive the output DC voltage equation for 6-pulse line commutated converter. Also prove that power factor of converter is proportional to cosine of firing angle. **07**
- OR**
- Q.4** (a) Explain basic requirements of firing circuits used in HVDC system. Also explain types of firing schemes used in HVDC system. **07**
(b) Giving block diagram, explain working of Power Controller. **07**
- Q.5** (a) Explain the working of Voltage Source Converter operation and its principle. **07**
(b) Showing circuit diagram, explain working of Unified Power Flow Controller (UPFC). **07**
- OR**
- Q.5** (a) Showing block diagram, explain working of Constant Extinction Angle Controller used in Converter Control of HVDC system. **07**
(b) Compare the performance of static compensators TCR and TSC. **07**
