Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER-VII EXAMINATION - WINTER 2015

Subject Code:X70904 Date:07/12/2015 Subject Name: Advanced Power System - I Time: 10:30pm to 1:00pm **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 principle and function of STATCOM, SSSC and UPFC. 07 (b) Explain load compensation and system compensation for uncompensated 07 transmission line. Enlist the application of HVDC system. **Q.2** 07 What are the objectives of line compensation? Discuss shunt compensation in 07 detail. OR (b) Show the relationship between power P, midpoint voltage Vm and load angle δ 07 for lossless line. Discuss the observations made from these relationships. Q.3 Explain working of 12 pulse TCR. 07 (b) Explain operating characteristic of saturated reactor. Where is saturated reactor 07 employed? OR **Q.3** (a) Write a short note on: Automatic Generation Control and Excitation Control. **07** (b) How the synchronous condenser controls reactive power in power system? 07 Discuss its main applications. Give comparison between Classical HVDC and HVDC-VSC. **Q.4** 07 **(b)** Write Notes on sources of harmonics in HVDC system. 07 0.4 What is HVDC-VSC system? Give its advantages and application. 07 (b) Explain power reversal characteristics and correction inverter characteristics in 07 a DC Link. Q.5 Draw the typical layout of HVDC transmission system. Give the function of **07** component used in HVDC transmission system. (b) Explain two level voltage converter. What are the advantages of IGBTs over 07 SCRs for HVDC converter? OR (a) What is excitation control system? What are the limitations of excitation control **07 Q.5** system under asymmetrical fault? (b) What are the non-characteristic harmonics in HVDC systems? How they are 07

generated?