

Code: **EEPC1T2**

**I M.Tech-I Semester-Regular/Supplementary Examinations
January 2017**

**HVDC TRANSMISSION
(POWER SYSTEM CONTROL AND AUTOMATION)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. Write Technical notes on the following. 14 M
 - a) Back-to-Back HVDC coupling system.
 - b) Back to Back DC link along with AC feeder.

2. a) Explain the operation of 12 pulse bridge rectifier with relevant waveforms. 7 M

b) Derive from fundamentals, the expression for voltage and current for the operation of six pulse converter as rectifier and inverter with delay angle and overlap angle. Draw its wave forms. 7 M

3. What are the filter configurations that are employed for HVDC converter station? Give design aspect of one such filter. 14 M

4. Explain in detail the converter control characteristics of HVDC systems. 14 M

5. a) Explain harmonic instability problems in HVDC systems. 7 M
- b) Discuss the interaction between HVAC and DC systems. 7 M
6. a) Give the comparison between Series and Parallel connections of MTDC Systems. 7 M
- b) What are the applications of MTDC systems? 7 M
7. a) Explain the over voltage protection in converter station. 7 M
- b) Explain the disturbances on the AC side / DC side due to over voltages. 7 M
8. Write short notes on the following: 14 M
- a) DC line protection
 - b) Commutation failure
 - c) DC breakers