

**M.Tech 1st Semester (Electric Power System)  
Examination, December-2017**

**HVDC TRANSMISSION**

**Paper-MTEPS-102**

*Time allowed : 3 hours* *[Maximum marks : 100]*

*Note : Attempt any five questions.*

1. (a) Discuss the basic conversion principle for HVDC transmission. 10  
(b) Discuss the different factors that favour HVDC transmission system over EHV transmission over long distances. 10
2. (a) Explain the equivalent circuit for converter and special features of converter transformer. 10  
(b) Discuss the HVDC static power converter with 12-pulse configuration. 10
3. Mention the configurations and impedance characteristics of various types of filters. Give design aspects of single tuned filter. 20
4. (a) Discuss about characteristic and non-characteristic harmonics generated in HVDC system. 10  
(b) What are the adverse effect of harmonics produced by the HVDC converters ? 10

5. What are the different harmonics generated in voltage and current wave form on both AC and DC side in case of a 6 pulse converter ? 20
6. (a) Describe the harmonic instability problem and voltage interaction between HVAC and DC system. 10  
(b) Explain the operation and control of multi terminal DC link series system. 10
7. (a) What are the source for over voltage's in HVDC system ? How are they controlled ? 10  
(b) Discuss the need for circuit breakers in HVDC links. 10
8. Write a short note on faults occurring in HVDC system and their protections. 20