Code No: NR410205 **NR**

IV B.Tech I Semester Supplementary Examinations, April/May 2005
HVDC TRANSMISSION
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Compare the power transfer capacities of A.C. and D.C. transmission systems when an existing A.C. line is converted into D.C. line, with following conditions:
   i. Same current and insulating level.
   ii. Same percentage losses and insulation level.
   (b) Prove that insulation required for D.C. system is 0.866 times that required for A.C. system. Assume the power transmitted, percentage losses and size of conductors are same for both systems.
2. Clearly explain the different converter configurations commonly employed for HVDC converter and bring out their relative merits and demerits.
3. Draw and explain a block diagram of the Hierarchical levels of controls of HVDC transmission system.
4. Write a note on the following sources of reactive power
   (a) Synchronous condensers
   (b) Static VAR system
5. Obtain the mathematical model of a d.c. network and d.c. converter, including converter controller.
6. (a) Explain the fault clearing process in H.V.D.C. poles. Explain how are the H.V.D.C. equipment protected against prolonged short circuit currents though there is no H.V.D.C. circuit breaker on H.V.D.C. pole side.
   (b) Explain the protection provided for DC line .
7. Why are harmonics generated in HVDC converter and what are the problems associated with the harmonics. Suggest some remedial measures.
8. Give a detailed account of design aspects of the following filters:
   (a) Single tuned filter
   (b) Double tuned filter.

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