

FACULTY OF ENGINEERING

B.E. IV/IV Year (E & EE) I Semester (Main) Examination, December 2010

HIGH VOLTAGE DC TRANSMISSION

(Elective - I)

Time : 3 Hours]

[Max. Marks : 75

Part A — (Marks : 25)

Answer **all** the questions from Part A.

Answer **five** questions from Part B.

1. List out the drawbacks and limitations of HVDC transmission system. 4
2. What are the properties of HVDC converter circuits? 3
3. Give the equivalent circuit of an Inverter. 4
4. Define Pulse number. 2
5. List out the requirements of ideal control system for a HVDC converter. 4
6. What are the causes of arc back? 2
7. What factors need to be considered in the design of harmonic filters? 4
8. Draw typical parallel MTDC system. 2

Part B — (Marks : 50)

9. (a) Discuss different kinds of HVDC links. 3
- (b) Explain the economic considerations in erecting a HVDC system. 3
- (c) Explain the Corona loss in ac and dc systems. 4
10. (a) Give the analysis of bridge converter with Grid control and overlap angle. 6
- (b) Explain the operation of a HVDC converter as an inverter. 4
11. Explain the following controls of a HVDC converter.
 - (a) Constant Current Control. 5
 - (b) Constant Extinction angle control. 5

12. (a) Explain different types of Harmonics introduced by HVDC converters. 4
(b) Explain different types of filters used to eliminate Harmonics in a HVDC system. 6
13. (a) Explain the operation of a DC circuit breaker with the help of general arrangement and current & voltage waveforms. 6
(b) Describe the four variables which characterize the DC breaker. 4
14. (a) Describe the causes of overvoltages and protection against them. 5
(b) Explain the functioning of DC smoothing reactors. Also discuss the factors effecting the sizing and location of reactors. 5
15. (a) Explain different types of MTDC systems, comparing their salient features. 5
(b) Explain constant voltage control of parallel MTDC line. 5