Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

Previous semester examination - December 2022

Program: B. Tech. (Electrical) *Sem VIII*

Duration: 3 hrs.

Course Code: PE-BTE803

Maximum Points: 100

Course Name: HVDC Transmission System

Semester: VIII

Notes:

1. Question number 1 compulsory.
2. Attempt any **four** questions out of remaining **six**.
3. Draw neat diagrams.
4. Assume suitable data if necessary.

Q. No.	Questions	Pts.
1.(a)	What is voltage dependent current order limit and how is it implement in HVDC power flow control? Support your answer with neat circuit diagram and characteristics.	10
(b)	Compare AC & DC transmission system based on the factors (a) Economics of transmission (b) Technical performance (c) Reliability	10
2.	Considering effect of firing angle delay and commutation overlap, obtain expression of average DC voltage, AC current and reactive power absorbed by the 3-phase 6-pulse converter? Support your answer with relevant diagram & hence obtain the equivalent circuit of HVDC link using LCC.	20
3.(a)	What is meant by individual phase control and what are the drawbacks of this control and explain how this drawbacks can be eliminated?	10
(b)	Explain principle of link control in a VSC HVDC system?	10
4.(a)	How is stability enhancement is attained using an HVDC link?	10
(b)	What is SVPWM technique & how is implemented in VSC based HVDC system?	10

5.(a)	Draw basic diagram of phase locked loop showing voltage and hence mention how is the required output derived?	10
(b)	Explain the constant extinction angle control and constant current control?	10

6.	Explain in short
	   1. Multi terminal link and point to point link
	   2. Modular multi-level controller
		20

7.(a)	Draw the V-I characteristics and explain the complete power flow control including power reversal of the two terminal HVDC link.	10
(b)	Draw the typical layout of HVDC transmission system and explain functions of each part & component?	10