

B.E (E) VII (R)

Con. 2902-09.

HVDC TRANSMISSION

VR-4710

(3 Hours) page ①

[Total Marks : 100

Lib
4/6/19

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any **four** questions out of remaining **six** questions.(3) Assume any **suitable** data, if **required**.

B.E (E) VII Rev HVDC Transmission 4/6/19.

1. (a) Operation of the bridge converter with overlap angle in the range between 60° and 120° is abnormal. Justify the statement. 20
- (b) For a bridge converter with grid control and with overlap less than 60° HASTEN

$$\text{Prove that } \cos \phi \cong \cos \alpha - \frac{R_c I_d}{V_{do}}$$

- (c) Explain the importance of current margin.
- (d) Explain with neat diagram 'Mode Stabilization'.
2. (a) Explain with neat diagram the components of HVDC Transmission System. 10
- (b) Explain with neat waveforms single commutation failure. 10
3. (a) Derive the steady state equivalent circuit of HVDC converter. 12
- (b) 'Converter consumes reactive power'— Justify the statement. 8
4. (a) Explain with neat waveforms of voltage and currents, the commutation from a normally operating rectifier bridge to the by pass valve. 10
- (b) Describe with neat diagram different filters used in HVDC Transmission System. 10
5. (a) Explain the problem caused while connecting a weak AC System to a DC System. How it can be eliminated? 10
- (b) Explain equidistant pulse control schemes used in HVDC valves. What are its advantages? 10
6. (a) Explain power reversal in HVDC system with control characteristics. 10
- (b) Explain with neat diagram and waveforms the principle of 12 pulse converter. 10
7. Write short notes on any **two** :— 20
- (a) Causes and effect of Harmonics
- (b) Starting and stopping of a DC link
- (c) Recent trends in HVDC.