

QP Code : 2490

Marks: 100

Time: 3 Hrs

Note: 1. Question no. 1 is compulsory.**2. Attempt any four questions out of remaining.****3. Assume suitable data if necessary.**

- Q1. a) Describe with neat diagrams constant voltage control and constant- β control? [20]
 b) Explain ground return, its advantages and problems?
 c) Operation of the bridge converter with overlap angle in the range between 60° and 120° is abnormal. Justify the statement
 d) For a bridge converter with grid control and overlap less than 60°
 Prove that $\cos\phi \cong \cos\alpha - \frac{I_d R_c}{V_{do}}$
- Q2. a) Describe with neat diagrams single commutation failure of converters? What are the causes and effect of commutation failure? [10]
 b) Explain with neat diagram different types of HVDC links [10]
- Q3. a) Derive the equivalent circuit of HVDC converter. [10]
 b) Describe HVDC system control Hierarchy? [10]
- Q4. a) Explain with neat diagram the components of HVDC transmission system? [10]
 b) Describe the transfer of current from a three phase bridge rectifier to bypass valve? [10]
- Q5. a) Explain with control characteristics the power reversal in HVDC system? [10]
 b) Explain the equidistant pulse control scheme and individual phase control scheme used in HVDC system? [10]
- Q6. a) Explain the causes and effect of harmonics [10]
 b) Describe with neat circuit diagram and waveform the working of a twelve pulse converter [10]
- Q7. Write short notes on (any three) [20]
 a) Starting and stopping of HVDC links
 b) VDCOL control
 c) Comparison of AC and DC transmission
 d) Different types of filters used in HVDC