

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY PUTTUR-517 583
(AUTONOMOUS)**



QUESTION BANK

Course and Branch: M.Tech & EEE

Specialization: Power Electronics

Subject: HVDC TRANSMISSION SYSTEM

Subject Code : 20EE2125

Year & Sem : II & I

Regulation:R20

UNIT-I

| | | |
|----|---|-----------------|
| 1 | Give the comparison between AC and DC Transmission and explain the factors in detail? | [L3] [CO1][10M] |
| 2 | What are the applications of DC Transmission and also mention the modern trends in HVDC technology | [L3] [CO1][10M] |
| 3 | Explain the line commutated converter based systems? | [L2] [CO1][10M] |
| 4 | Explain the basic conversion principles with neat circuit diagrams? | [L2] [CO1][10M] |
| 5 | With the help of neat schematic diagram explain the operation of 3-Phase, 6 Pulse Graetz's Circuit? | [L2] [CO1][10M] |
| 6 | Draw the typical layout of HVDC transmission system and explain each part? | [L2] [CO1][10M] |
| 7 | Explain the types of HVDC links and its purpose with neat diagr? | [L2] [CO1][10M] |
| 8 | Write the special features of converter transformers? | [L3] [CO1][10M] |
| 9 | Explain the Basic conversion principles of a HVDC Transmission system? | [L1] [CO1][10M] |
| 10 | Mention the advantages of HVDC technical economical reliability aspects? | [L2] [CO1][10M] |

UNIT-II

| | | |
|----|---|------------------|
| 1 | Explain the rectifier and inverter operation of a power converter and also write the equivalent circuit of converter? | [L2] [CO2][10M] |
| 2 | Derive the expressions for average dc voltage, AC current and reactive power absorbed by the converter? | [L2] [CO2] [10M] |
| 3 | Explain the Effect of Commutation Failure, Misfire and Current Extinction in LCC links? | [L3] [CO2] [10M] |
| 4 | Explain the Sinusoidal Pulse Width Modulation? | [L2] [CO2] [10M] |
| 5 | Explain the Selective Harmonic Elimination? | [L1] [CO2] [10M] |
| 6 | Explain the Two and Three-level VSCs? | [L2] [CO2] [10M] |
| 7 | Explain the special features of converter transformers? | [L2] [CO2] [10M] |
| 8 | Explain the rectifier and inverter operation of a power converter and also write the equivalent circuit of converter? | [L1] [CO2] [10M] |
| 9 | Draw the schematic diagram of a typical HVDC converter station with 2 six pulse converter units and explain the function of each component? | [L2] [CO2] [10M] |
| 10 | Explain the constructional features of a converter transformer and explain the working of 12pulse converter circuit? | [L1] [CO2] [10M] |

UNIT-III

| | | |
|----|--|------------------|
| 1 | Explain the Principles of Link Control in a LCC HVDC system? | [L2] [CO3][10M] |
| 2 | Give detailed explanation of about two firing angle controls? | [L2] [CO3] [10M] |
| 3 | Explain Higher level Controllers Power control, Frequency Control? | [L2] [CO3] [10M] |
| 4 | Explain the Stability Controllers, Reactive Power Control? | [L2] [CO3] [10M] |
| 5 | Explain the Principles of Link Control in a VSC HVdc system? | [L2] [CO3] [10M] |
| 6 | What is the meaning of ignition angle control and explain individual phase control and equidistant control method? | [L2] [CO3] [10M] |
| 7 | What is meant by individual phase control and what are the draw backs of this control and explain how these drawbacks can be eliminated? | [L1] [CO3] [10M] |
| 8 | Explain in detail about equidistance firing angle scheme. Also list the draw backs of this scheme? | [L2] [CO3] [10M] |
| 9 | Explain the constant extinction angle control and constant current control? | [L2] [CO3] [10M] |
| 10 | Explain the terms constant ignition angle control and constant extinction control? | [L2] [CO3] [10M] |

UNIT-IV

| | | |
|----|--|------------------|
| 1 | Explain about voltage interaction? | [L2] [CO4][10M] |
| 2 | What is meant by DC Power modulation? Explain it in detail. | [L1] [CO4] [10M] |
| 3 | Briefly explain what are the different harmonic instability problems? | [L2] [CO4] [10M] |
| 4 | Explain the DC power modulation scheme used in interconnected operations of AC and DC Systems. | [L1] [CO4] [10M] |
| 5 | Explain the interaction between HVAC & DC systems? | [L3] [CO4] [10M] |
| 6 | What are the major types of AC-DC systems interaction and also explain about the harmonic interactions in details? | [L3] [CO4] [10M] |
| 7 | Explain the voltage stability in AC/DC system in detail? | [L1] [CO4] [10M] |
| 8 | What are the different types of converter faults and explain at least three of the faults in details?. | [L2] [CO4] [10M] |
| 9 | Explain transient over voltage due to DC and AC side line faults with neat sketches? | [L1] [CO4] [10M] |
| 10 | Explain how transient over voltages are produced due to faults on DC side | [L2] [CO4] [10M] |

UNIT-V

| | | |
|----|---|-----------------|
| 1 | List out different types of multi-terminal DC links with suitable diagrams? | [L1] [CO5][10M] |
| 2 | Explain parallel connected multi terminal DC link with suitable diagram? | [L1] [CO5][10M] |
| 3 | Explain series parallel connected multi terminal DC link with suitable diagram? | [L1] [CO5][10M] |
| 4 | Explain series connected multi terminal DC link with suitable diagram? | [L2][CO5][10M] |
| 5 | Discuss series-parallel multi-terminal HVDC system and its control? | [L3][CO6][10M] |
| 6 | Mention the importance of multi-terminal DC links? | [L2][CO6][10M] |
| 7 | What are the advantages of Multi-terminal DC links? | [L1][CO6][10M] |
| 8 | Give the comparison between series and parallel MTDC systems? | [L2][CO6][10M] |
| 9 | Differentiate between Multi-Terminal and Multi-Infeed Systems? | [L3][CO6][10M] |
| 10 | Explain about Modern Trends in HVdcTechnology? | [L2][CO6][10M] |

Prepared by
Dr J. Gowrishankar
Professor ,
Department of EEE,
SIETK, Puttur