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B.Tech. VIII Sem. (Back) Examination, April/May - 2024 Electrical Engineering. 8EE4-11 HVDC Transmission System	

Time : 3 Hours
 Maximum Marks : 120
 Min. Passing Marks : 42

Instructions to Candidates:

Attempt all Ten questions from Part A. Five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

ALL questions are Compulsory

(10×2=20)

1. Summarize the difference between AC and DC Transmission System.
2. What are the advantages of Multi-terminal DC links?
3. Classify the different types of DC Links.
4. Discuss the advantages and disadvantages of HVDC transmission.
5. Mention some converters used in HVDC Systems.
6. Mention the types 2-types of Firing Schemes.
7. Mention the different converter control characteristics.
8. Mention the different types of filters.
9. What are the conditions VSC based HVDC Link?
10. Justify the purpose of Constant Extinction Angle.

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PART - B

(Analytical/Problem solving questions)

Attempt any FIVE questions

(5×8=40)

1. Discuss the following types of MTDC Systems
 - i) Series MTDC Systems
 - ii) Parallel MTDC systems.
2. With a neat diagram explain the components of HVDC Converter station.
3. Difference the terms
 - i) HVDC Converters
 - ii) Line Commutated Converters.
4. Mention the assumption needs to consider for the analysis of 6-pulse converter.
5. Analyse and draw the diagram for Current and Extinction Angle control.
6. Explain the Sinusoidal Pulse Width Modulation.
7. Explain the voltage stability in AC/DC system in detail.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any FOUR questions

(4×15=60)

1. Illustrate the circuit diagram analysis of a 12-pulse converter. And also calculate
 - i) Average DC output voltage
 - ii) Current harmonics with suitable expression and waveforms.
2. Explain the diagram of system control hierarchical structure of HVDC Link.
3. Explain about Modern Trends in HVDC Technology?
 - a) Explain about Modern Trends in HVDC Technology?
 - b) Differentiate between Multi - Terminal and Multi - Infeed systems?
4. What are the different types of converter faults and explain at least three of the faults in details.
 - a) What are the different types of converter faults and explain at least three of the faults in details.
 - b) Explain how transient over voltages are produced due to faults on DC side.
5. What is meant by DC Power modulation. Explain the DC power modulation scheme used in interconnected operations of AC and DC Systems.

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