

13EE42E1-HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

(EEE)

Lectures/Week: 4Hrs.
End Exam Duration: 3Hrs

Credits: 4
Sessional Marks: 40
End Exam Marks: 60

UNIT-I

D.C. POWER TRANSMISSION TECHNOLOGY: Introduction, Comparison of AC & DC transmission, Description of DC Transmission system, Converter station, Planning of HVDC transmission, Modern trends in DC Transmission.

UNIT-II

ANALYSIS OF HVDC CONVERTERS: Pulse number, Choice of converter configuration-valve rating, Transformer rating. Simplified analysis of graetz circuit with and without overlap, Rectifier and Inverter waveforms, Converter bridge characteristics.

UNIT-III

CONVERTER AND HVDC SYSTEM CONTROL: Principles of DC link control, Converter control characteristics, System control hierarchy, Firing angle control, Current and excitation angle control, starting and stopping of DC link, Power control, higher level controllers.

UNIT-IV

CONVERTER FAULTS AND PROTECTION: Protection against over currents, Over voltages in a converter station, surge arresters, protection against over voltages.

SMOOTHING REACTOR AND DC LINE: Smoothing reactors, DC line, Transient over voltages in DC line, Protection of DC line, DC breakers.

UNIT-V

REACTIVE POWER CONTROL: Reactive power requirements in steady state, Sources of reactive power, Static var systems.

HARMONICS AND FILTERS: Generation of Harmonics, Design of AC filters, DC filters, Carrier frequency and RI noise.

TEXT BOOKS:

1. "HVDC Power Transmission System" by K.R Padiyar; New academic science Ltd publication.
2. "EHV-AC &HVDC Transmission Engineering & Practice" by S. Rao; Khanna publication.

REFERENCES:

1. "Direct current Transmission" by Edward Wilson Kimbark, Volume-I.
2. "HVDC Power Transmission" by S.Kamakshaiah & V.Kamaraju; Tata McgrawHill publishers.