

Code No: 157BY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year I Semester Examinations, July/August - 2022****HVDC TRANSMISSION****(Electrical and Electronics Engineering)****Time: 3 Hours****Max.Marks:75**

Answer any five questions
All questions carry equal marks

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- 1.a) What is surge impedance loading? Give its physical significance and explain how the voltage profile of AC line is governed by load and length of the line.
- b) With a neat schematic diagram, state the various apparatus required for HVDC station and explain the purpose of each. [8+7]
- 2.a) Give the choice of Converter configurations for 6 pulse HVDC converter and compare them.
- b) Obtain the relation between the DC output voltage and the AC line voltage (rms) and rating of the converter transformer with Graetz's converter circuit. [7+8]
- 3.a) What are the desired features of HVDC link from control point of view.
- b) Derive the equivalent circuit for HVDC link from its voltage and current equations.[7+8]
- 4.a) Explain the steps involved in starting and stopping a DC link.
- b) Briefly discuss about reactive power management under steady state and during transients in HVDC system. [7+8]
5. Explain in detail with DC link modeling and control equations, the simultaneous method of AC/DC power flow. [15]
6. Explain in detail the sequential method of AC/DC load flow. Give the relevant DC link modeling and control equations. [15]
7. Explain the method employed for over current and over voltage protection in HVDC link. [15]
8. Give the effect of converter pulse number on harmonic generation. Explain what are characteristic and non-characteristic harmonics and their significance and effects of AC and DC side of the converter. [15]

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