

Code No: 157BY**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, February/March - 2022****HVDC TRANSMISSION****(Electrical and Electronics Engineering)****Time: 3 Hours****Max. Marks: 75****Answer any Five Questions
All Questions Carry Equal Marks**

- 1.a) State advantages and disadvantages of DC over AC transmission system.
- b) With neat sketch, explain various types of HVDC systems. Briefly discuss about their merits and demerits. [6+9]
- 2.a) Draw the circuit diagram of Graetz circuit.
- b) Draw the equivalent circuit representation of HVDC system for steady state analysis and indicate various voltage stages. [6+9]
3. With the aid of combined inverter-rectifier characteristics explain the following HVDC control schemes
 - a) constant-minimum-ignition-angle control
 - b) constant current control
 - c) constant-extinction-angle control [15]
- 4.a) State the important basic controls required for the operation of HVDC systems and explain how they work and maintain system stability under abnormal conditions.
- b) Does HVDC converter consume reactive power? Justify your answer. [8+7]
5. Give the DC link and Converter modeling equations in per unit quantities for carrying ac-dc load flow studies. [15]
6. Explain the various steps involved in sequential method for AC/DC load flow. [15]
7. What are the different types of faults that can occur in HVDC systems? Discuss their nature and occurrence. [15]
8. Identify the various sources for generation of harmonics in HVDC systems and mention the various adverse effects caused due to the presence of harmonics. [15]

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