

Code No: 137DG

**R16**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year I Semester Examinations, March - 2021**

**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) Compare HVAC and HVDC system with respect to power transfer capability, length of the line, and system stability.
- b) Describe the typical HVDC bipolar transmission system and mention the function of each element. [8+7]
  
- 2.a) Discuss about the choice of converter configuration for HVDC transmission.
- b) Analyze the three-phase full wave 6-pulse bridge converter operation, with the help of neat circuit diagrams. Draw the steady state ac and dc side voltage and current waveforms. [6+9]
  
- 3.a) Give the steady state dc voltage expressions for rectifier and inverter operation and draw the equivalent circuit representation of HVDC system.
- b) Draw the control characteristics of rectifier and inverter operation of HVDC converters and explain the various regions of converter characteristics. [7+8]
  
- 4.a) Derive the relation between the ac side power factor angle and converter firing angle.
- b) Explain the strategies employed to meet the steady state reactive power requirements of DC link converters. [7+8]
  
5. Explain in detail the sequential method of AC/DC load flow. Give the relevant DC link modelling and control equations. [15]
  
6. Explain Simultaneous AC-DC Power flow method. [15]
  
7. Explain about the schemes employed for over current protection in HVDC link. [15]
  
8. What are the different types of filters used in HVDC converter station? Explain their objectives and design aspects. [15]

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