



R18 Regulation

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

(Autonomous, Accredited by NAAC with 'A' Grade)

**B.Tech VIII Semester Regular Examinations, June 2022**

Subject code: 2E8BA

**HVDC TRANSMISSION SYSTEMS**  
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 70

Date: 17.06.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

**Part-A**

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 List the components of the HVDC Transmission system.
- 2 Point out any 4-HVDC projects in India.
- 3 Mention the function of Higher-level controllers in an HVDC System.
- 4 Compare SVC and STATCOM used in HVDC systems.
- 5 Draw and show the equivalent basic circuit model of the converter.
- 6 Mention the different methods for power flow analysis.
- 7 Write the various nature of converter faults.
- 8 Refer the effects of a single commutation failure.
- 9 Name the sources of harmonics and write the effect of trouble caused by Harmonics.
- 10 Write down the effect of pulse number on harmonics Filters.

**Part-B**

Answer All the following questions.

(5X10M=50Marks)

- 11 A. Give the comparison between AC and DC Transmission and explain the factors in detail. (5M)  
B. What are the applications of DC Transmission and also mention the modern trends in HVDC technology? (5M)
- OR
- 12 A. Illustrate the circuit diagram for the 12-Pulse Converter for HVDC System. (5M)  
B. Justify the formulae for average direct voltage expression for Graetz circuits. (5M)
- 13 A. Illustrate the principles of DC Link Control with its Equivalent and Schematic Diagram. (5M)  
B. Generalize the block diagram of the Firing Angle Control (FAC) scheme. (5M)
- OR
- 14 A. Explain Reactive Power Requirements in steady-state HVDC Systems. (5M)  
B. Discuss in detail about Static Var Compensator(SVC) used for HVDC systems with suitable circuits and represent its different characteristics. (5M)

- 15 With a neat diagram flowchart and examine the solution methodology for AC-DC Power Flow. (10M)  
OR
- 16 A. With a sketch explain the DC Model for HVDC System. (5M)  
B. Examine the per-unit system for HVDC Systems for DC Power transmission. (5M)
- 17 A. Explain the various mechanisms used for protecting the converter station from overcurrent. (5M)  
B. Discuss corona loss in an HVDC link. (5M)  
OR
- 18 A. Briefly explain the overvoltage protection scheme in the HVDC system. (5M)  
B. Explain the Radio Interference characteristics of the HVDC system. (5M)
- 19 A. Evaluate the criteria for the design of the DC Filter. (5M)  
B. Write short notes and explain the terms. (5M)  
(i) Harmonic Distortion (ii) Non-Harmonic Distortion  
OR
- 20 A. What are the types of AC Filter? Also, explain the criteria for the selection of filter. (5M)  
B. Illustrate on a single tuned Filter. (5M)