



R18 Regulation

Subject code:2E8BA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VIII Semester Regular/Supplementary Examinations, April 2023

HVDC Transmission Systems

(Electrical and Electronics Engineering)

Maximum Marks: 70

Date:03.05.2023 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 out the applications of HVDC
- 2 Explain types of HVDC links.
- 3 Draw the schematic diagram of three & two valve conduction mode.
- 4 What are the sources for reactive power?
- 5 With a neat sketch, explain about DC network.
- 6 What is meant by Modeling of DC Links?
- 7 What are the measures to be taken to reduce corona effect in HVDC transmission lines?
- 8 What are the different types of converter faults?
- 9 Write two functions of filter.
- 10 What are the characteristics of harmonics?

Part-B

Answer All the following questions.

(10MX 5=50Marks)

- 11 Draw the layout of a Bi-polar HVDC substation and briefly discuss about various components present. [10M]

OR

- 12 a) What are the advantages of HVDC Transmission systems? [5M]
b) Explain HVDC Characteristics and Economic Aspects in the HVDC Transmission? [5M]

- 13 Derive the expression for input power, output power and power factor of 12- pulse bridge converter with delay angle α . Assume there is no overlap. [10M]

OR

- 14 a) Draw the waveforms and explain 12 Pulse converters for the conduction angle of 120 degrees for the RL-load? [5M]
b) List the factors that decide the converter configuration? [5M]

- 15 Write short notes on:

- a) Modelling of HVDC links. [5M]
- b) pu system for DC quantities. [5M]

OR

- 16 Classify the solution methodology for the AC-DC load flows and explain them briefly. [10M]

- 17 a) Discuss the operation of surge arrestors for overvoltage protection of HVDC systems. [5M]
b) What are the basic principles of overcurrent protection? [5M]
OR
- 18 a) Explain the Surge arrester and smoothing reactor in detail. [5M]
b) Explain over voltage and current protection in the converter station. [5M]
- 19 Explain the causes of harmonic generation in HVDC and effects on the system. [10M]
OR
- 20 a) Explain the design procedure for a single tune filter. [5M]
b) What are the different types of AC Filters? [5M]