Code: 15A02804

R15

B.Tech IV Year II Semester (R15) Regular Examinations April 2019

HVDC TRANSMISSION

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Explain why DC transmission is used instead of AC.
(b) What are the types of DC links and draw any one with neat sketch?
(c) List the various terminal equipment used in converter station.
(d) What are the special features of converters in HVDC transmission?
(e) Define constant extinction angle and constant ignition angle control of HVDC.
(f) Write short notes on principle of DC link control.
(g) What are the adverse affects of harmonics produced by the HVDC systems?
(h) Explain about characteristics and non-characteristics harmonics in HVDC system.
(i) What are the converter faults in HVDC system and explain any one type?
(j) Discuss the function of surge arrester.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Briefly explain the technical merits and economical considerations of HVDC over HVAC transmission systems.

OR

3 Briefly explain the principles of static conversion and static converter configuration.

UNIT – II

4 From the fundamentals, develop the equivalent circuit of HVDC link.

OR

5 Explain the operation of a 12 pulse bridge rectifier with the help of circuit diagram. Draw the relevant voltage & current waveforms.

UNIT – III

6 Draw the complete converter control characteristics and explain the principle of power control in a DC link.

OR

7 (a) Write in brief about control of voltage source converter with neat sketch diagram.
(b) Enumerate the relative merits and demerits of constant current control and constant voltage control of HVDC link.

UNIT – IV

8 Explain in briefly about harmonic generation sources in HVDC system.

OR

9 Explain why filter used in HVDC system and explain in brief of various types.

UNIT – V

10 (a) Briefly explain about over voltages due to DC and AC side line faults.
(b) Explain the type of converter faults and explain in brief.

OR

11 Explain the method of protection against over voltage and typical arrangement of surge arresters for a converter pole.

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