Code: 13A02803 **R13**

B.Tech IV Year II Semester (R13) Regular Examinations April 2017

HVDC TRANSMISSION

(Electrical and 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) What are the types of DC links?
(b) Draw the cost Vs distance curve of ac and dc transmission.
(c) What are the assumptions made to simplify the analysis of Graetz circuit?
(d) What is commutation voltage of valves?
(e) Explain overlap angle and extinction angle.
(f) What will be the current regulation in inverter side?
(g) Define total harmonic distortion.
(h) Write the characteristics of harmonics.
(i) What are the reasons for over voltages in HVDC systems?
(j) List out some methods, which can be used for over current protection.

PART – B

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

UNIT – I

2 (a) Compare AC & DC transmissions in detail.
(b) Explain the major components of a HVDC transmission in converter station unit.

OR

3 Explain in detail about the planning of HVDC transmission and explain the procedure for the selection of voltage level for a fixed power transfer.

UNIT – II

4 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.

OR

5 Explain the choice of converter configuration for any pulse number.

UNIT – III

6 Discuss in detail about the converter control characteristics of HVDC system.

OR

7 Explain constant current, extinction angle and ignition angle control methods.

UNIT – IV

8 Explain the need to employ filter circuit in HVDC systems. Derive an expression for minimum cost of tuned AC filter used in HVDC systems.

OR

9 (a) Write short notes on telephone influence factor and telephone harmonic form factor.
(b) Discuss in detail the design of a high pass filter.

UNIT – V

10 Explain the method of protection against over currents and mention the causes of over voltages in a converter station.

OR

11 Explain short circuit in bridge rectifier with required short circuit current expressions and draw the voltage and current waveforms during short circuit.