

Code: 13A02803

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)

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.