

Code: EE7T2

IV B.Tech - I Semester – Regular Examinations – October - 2017

**HVDC TRANSMISSION
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22

1.

- a) How would you explain the disadvantage in DC transmission?
- b) How would you discuss the modern trends in DC Transmission?
- c) How would you draw the steady state V_d Vs I_d characteristics under reversal of power flow?
- d) How would you describe the converter bridge characteristics?
- e) How would you explain the features of HVDC control?
- f) What is meant by extinction angle control?
- g) What are the equations for active and reactive powers on AC and DC side?
- h) What are kinds of harmonics present in a HVDC system?
- i) How would you analyze graetz bridge circuit?
- j) What do you understand by “characteristic harmonics” in HVDC system?

k) Write short note on Over-voltages on the HVDC system.

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) How would you describe the advantages and disadvantages of dc transmission system with following economics, reliability, and performance? 8 M

b) How would you explain the technological development of modern trends in dc transmission? 8 M

3. a) How would you describe the waveforms of 3- ϕ twelve pulse bridge rectifier? 8 M

b) Sketch the output dc voltage waveform and voltage across any one valve for 6-pulse bridge converter for the following two cases,

i) Delay angle $\alpha=30$ degree and overlap angle $u=5$ degree.

ii) Angle of advance $\beta=30$ degree and overlap angle $u=5$ degree. 8 M

4. a) How would you explain control of HVDC links? 8 M

b) How would you describe different firing angle control scheme adopted for HVDC systems with neat sketches? 8 M

5. a) How would you explain converters faults caused? Discuss protection has to be provide against such faults. 8 M
- b) How would you discuss the protection against over current in terms of selectivity, reliability and backup? 8 M
6. a) How would you explain the configuration of AC harmonic filters used in HVDC systems? 8 M
- b) How would you design the single frequency tuned filters and double frequency tuned filters? 8 M