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P.E.S. College of Engineering, Mandya - 571 401
 (An Autonomous Institution affiliated to VTU, Belgaum)
Eighth Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; June - 2016
HVDC Power Transmission

Time: 3 hrs

Max. Marks: 100

Notes: Answer any **FIVE** full questions, selecting atleast **TWO** full questions from each **part**.

PART - A

- 1 a. Bring out merits of HVDC and HVAC transmission systems with respect to ; 10
 i) Economics of transmission ii) Technical Performance iii) Reliability.
- b. What is a DC link? Explain different types of DC links. 10
- 2 a. What is thyristor valve? Explain single phase full wave rectifier circuit with a neat circuit diagram and show the waveforms of voltage and current. 12
- b. Compare single phase and three phase converters. 8
- 3 a. What is a Graetz circuit? And choice of converter configuration. 8
- b. Explain Two and Three valve conduction mode of Graetz circuit and derive expression for average direct voltage. 7
- c. A Graetz circuit operating in the two and three valve conduction mode has line to line voltage of 100 kV, $\alpha = 25^\circ$ and $u = 30^\circ$, compute average DC voltage. 5
- 4 a. Write short notes on: 20
 i) Modern trends in DC transmission
 ii) Valve characteristics iii) Converter $V_d - I_d$ characteristics

PART - B

- 5 a. Explain principles of DC link control. 8
 b. Explain converter controller characteristics. 8
 c. Compare manual control and automatic control. 4
- 6 a. Explain arc back, Arc through, misfire and commutation failure. 8
 b. Discuss an over current protection in converters. 6
 c. What is an over voltage? Discuss on the factors causing over voltages in a converter station. 6
- 7 a. Distinguish characteristic and Non characteristic harmonics. 8
 b. What are the troubles caused by harmonics and means to reducing them? 6
 c. Explain different types of AC filters. 6
8. Write short notes on : 8
 a. MTDC systems 8
 b. DC circuit breakers 6
 c. Telephone interference. 6