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Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
HVDC Transmission

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. What are the principle applications and limitations of DC transmission system? (08 Marks)
 - b. Explain the different types of DC links with relevant schematic diagrams. (06 Marks)
 - c. Compare AC and DC transmission. (06 Marks)

- 2
 - a. Draw the schematic diagram of a typical converter station of a HVDC link. Explain the function of each component. (10 Marks)
 - b. Explain the modern trends in DC transmission. (06 Marks)
 - c. What are the operating problems in HVDC system? (04 Marks)

- 3
 - a. Explain the principle of operation of a Graetz circuit. Derive the voltage expression of a 6 pulse converter without overlap. (14 Marks)
 - b. Explain the concept of pulse number. (06 Marks)

- 4
 - a. What is the criteria for choice of best circuit for HVDC converter. (06 Marks)
 - b. Explain the three-phase one-way rectifier circuit with waveform. (08 Marks)
 - c. Explain with a neat sketch twelve – pulse cascade of two bridges. (06 Marks)

PART – B

- 5
 - a. Describe the complete characteristics of rectifier. (10 Marks)
 - b. A Graetz bridge operates with a delay angle of 15° . The leakage reactance of the transformer is 10 ohms. The line to line AC voltage is 85kV. Compute the overlap angle and DC voltage for $I_d = 2000A$. (10 Marks)

- 6
 - a. What are the limitations of manual control? (08 Marks)
 - b. Explain in detail the individual characteristics of both rectifier and inverter. (12 Marks)

- 7
 - a. With a neat diagram, explain constant current regulator. (08 Marks)
 - b. What are the desired features of control? (06 Marks)
 - c. Explain the basic means of control. (06 Marks)

- 8
 - a. What are the advantages of DC reactors? (04 Marks)
 - b. Describe the methods for clearing the short circuits. (10 Marks)
 - c. What are the causes for DC line oscillations? (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.