B.Tech. Degree VII Semester Examination November 2013

EE 705 (B) HIGH VOLTAGE DC TRANSMISSION
(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A
(Answer *ALL* questions)

(8 x 5 = 40)

I. (a) Explain different types of DC link configuration.
(b) Explain the valve firing scheme with a neat diagram
(c) Explain the following terms related to converter configuration.
    (i)   Valve utilization factor
    (ii) Transformer utilization factor
(d) Explain the effect of source reactance on converter circuit.
(e) Explain pulse frequency control.
(f) Write short notes on the following converter faults.
    (i)   Arcthrough
    (ii) Misfire
(g) Explain the concept of DC circuit interruption.
(h) Describe Thyristor Controlled Reactor (TCR).

PART B

(4 x 15 = 60)

II. (a) Explain major components of HVDC converter station using suitable diagrams. (10)
(b) Describe modern trends in DC transmission. (5)
OR
III. (a) What are the different considerations taken into account in the design of valve? (5)
(b) Compare AC and DC transmission system based on technical performance and reliability. Give the applications of DC transmission system. (10)

IV. (a) Explain the rectifier characteristics of a six-pulse converter. (7)
(b) Explain three and four valve conduction mode of a graetz circuit. (8)

OR
V. (a) Explain the characteristics of a twelve-pulse bridge converter circuit. (8)
(b) Explain the simplified analysis of graetz circuit without overlap. (7)

VI. (a) Explain converter control characteristics. What are the two requirements which necessitates the modification of control characteristics. (8)
(b) Explain hierarchical control structure of a DC link. (7)
OR
VII. (a) Describe the principles of DC link control. (7)
(b) Explain over voltages in a converter station and protection against over voltages. (8)

VIII. (a) Explain potential application and types of multi terminal DC system. (10)
(b) Write short notes on DC line insulation. (5)
OR
IX. (a) Describe the philosophy and tools of HVDC system simulation. (6)
(b) What are the sources of reactive power in a HVDC system and how it can be eliminated? (9)

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