DU – 109

VIII Semester B.E. (E&E) Degree Examination, Dec. 2017/Jan. 2018
(2K11 Scheme)
EE801 : HVDC AND FACTS

Time : 3 Hours Max. Marks : 100

Instruction : *Answer **two** from Part – **A**, **two** from Part – **B** and **one** question from Part – **C**.*

PART – A

1. a) Compare HVAC and HVDC power transmission on the basis of **12**
   i) Transmission of Real power
   ii) Technical performance
   iii) Planning
   iv) Economic factors.
   b) Differentiate between monopolar and bipolar links with respect to performance, advantages and disadvantages. **8**
2. a) Draw schematic diagram of HVDC power transmission system and briefly explain the function of each component. **10**
   b) Derive the expression for terminal voltage of 3-phase, 6-pulse converter bridge circuit with finite ignition delay and commutation over lap. **6**
   c) Two six pulse converter is connected to 3 -phase supply of 400 V, 50 Hz and operated at a firing angle of $\alpha = \frac{\pi}{4}$. The load current is 10 A and load voltage at 360 V. Calculate source inductance and over lap angle. **4**
3. a) Define the following :
   i) Harmonic Distortion
   ii) Telephone Influence factor
   iii) Harmonic form factor. **6**
   b) Explain the design procedure for filter, circuits on A.C. side of HVDC system. **10**
   c) Write a note on D.C. filters. **4**

P.T.O.

PART – B

4. a) With regard to HVDC converter control, explain the following :
   i) Constant ignition angle control
   ii) Constant current control
   iii) Constant extinction angle control. **9**
   b) Explain the different types of individual pulse control schemes. **8**
   c) What is current margin ? **3**

5. a) Explain the various types of converter faults and their effects. Which is the most severe fault ? **10**
   b) Explain briefly the different protection schemes adopted in HVDC system. **10**

6. a) Explain the types of MTDC system. Give comparison and applications of MTDC system. **10**
   b) Explain the transformer, converter and load modelling of HVDC system for dynamic simulation. **10**

PART – C

7. a) Mention the advantages of flexible A.C. Transmission system. **5**
   b) What is the significance of Reactive power ? What is line compensation ? **9**
   c) How FACTs are classified ? **6**

8. a) Explain briefly the operation of SVC and TCSC. **10**
   b) Write short notes on **any two** of the following : **10**
   i) TCR
   ii) UPFC
   iii) Series and shunt compensation
   iv) Objectives of load compensation.

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