Register Number …….

M.E. DEGREE EXAMINATIONS: APRIL/MAY 2010

Second Semester

POWER ELECTRONICS AND DRIVES

PED554: High Voltage Direct Current Transmission

Time: Three Hours **Maximum marks: 100**

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. What are the disadvantages of D.C Transmission?
2. What is the function of a High Frequency filter and where is it connected in D.C Transmission system?
3. Define Pulse number and name the three variations of equidistant pulse control?
4. What are the assumptions made for obtaining the fast steady state solution of the system equations for H.V.D.C converters?
5. Why the feedback control of power in a D.C link is not desirable?
6. What are the two basic firing schemes used in firing angle control?
7. What are the problems associated with the injection of harmonics into the A.C system and D.C line?
8. What are the reasons which produce Non-characteristic harmonics in H.V.D.C converters?
9. List out the various tools that can be employed for the simulation of a dynamic system?
10. What are the applications of a D.C Simulator?

PART B (5 x 16 = 80 Marks)

11. (a) (i) Describe the major components of a an H.V.D.C transmission system. (10)

(ii) Explain the applications of D.C transmission in detail. (6)

(OR)

(b) (i) Give a comparison of A.C and D.C transmission system pertaining to the economics of power transmission and technical performance. (10)

(ii) Explain the different types of D.C links with neat diagrams. (6)

12 (a) Describe the converter bridge characteristics used in H.V.D.C systems, when working as a rectifier and an inverter?

(OR)

(b) Draw the six pulse converter Graetz and analyse the circuit without overlap.

13 (a) (i) Explain the converter control characteristics. (8)

(ii) How the power control is carried out in H.V.D.C systems? (8)

(OR)

(b) (i) Comment on the starting and stopping of D.C link in H.V.D.C system. (8)

(ii) Draw and explain the Hierarchical control structure of D.C link. (8)

14 (a) What is the use of filters in H.V.D.C systems? How do you calculate A.C and D.C harmonics in H. V. D. C systems?

(OR)

(b) What are the design criteria of A.C filters? How will you mitigate the high levels of electrical noise in the carrier frequency and R.I radiation caused due to H.V.D.C system?

15 (a) (i) Explain the modeling of H.V.D.C system for digital dynamic simulation. (10)

(ii) What are the different system requirements while designing an H.V.D.C system? (6)

(OR)

(b) (i) Explain Parity simulator and give major advantages of parity simulator. (8)

(ii) List out the number of systems studies to design H.V.D.C system. (8)

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