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Question Paper Code : 80485

B.E. /B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Eighth Semester

Electrical and Electronics Engineering

EE 2032/EE 805/10133 EEE 35– HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

(Regulations 2008/2010)

(Common to: PTEE 2032 for B.E. (Part – Time) Seventh Semester – Regulations 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What are the three HVDC projects in operation in India?

2. What is the criterion for choosing the voltage level for long distance bulk power transmission?

3. What is valve utilization factor?

4. Draw the equivalent circuit of a HVDC system used in long distance transmission.

5. What is Compounding'? What type of compounding is adopted for converters and inverters?

6. What is the use of transformer tap changer control at the inverter side of an HVDC system?

7. What are the undesirable effects of harmonics injected into the AC system and DC line?

8. Draw the configuration of double tuned filter and its impedance characteristics.

9. Define corona effect.

10. What are the simulation tools available for the simulation of HVDC systems?

PART B — ($5 \times 16 = 80$ marks)

11. (a) With neat schematic diagrams discuss the DC transmission system in detail. (16)

Or

(b) Discuss the modern trends in DC transmission. Also describe the steps involved in planning the HVDC transmission system. (16)

12. (a) Explain the complete analysis of six-pulse Graetz converter circuit with overlap for two valve and three valve conduction mode. (16)

Or

(b) Describe the six-pulse converter bridge characteristics as rectifier and explain the different modes of operation of a 12-pulse converter for rectification. (16)

13. (a) Explain the equidistant pulse firing scheme with their variations using neat sketch. (16)

Or

(b) Explain the starting and stopping operations of DC link. (16)

14. (a) (i) Explain the characteristic and non-characteristic harmonics generated by HVDC converters. (10)

(ii) Describe the various criteria for judging the effectiveness of a DC filter. (6)

Or

(b) Explain the performance indices for the design of AC filters, and describe the procedure for the design of minimum cost tuned filters. (6+10)

15. (a) (i) What are the distinct differences existing between AC and DC insulation phenomena? (4)

(ii) List out

(1) The various system studies necessary for HVDC system simulation, and

(2) Advantages and disadvantages of digital dynamic simulation.

(6 + 6)

Or

(b) (i) Explain the following for HVDC cables: (6 + 2 + 2)

(1) Dieclectric stress distribution and inversion of stress with temperature

(2) Effect of gas pressure on dielectrics

(3) Economics of DC cables compared with AC cables.

(ii) What are the problems that can be studied using a HVDC Simulator? (6)

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