Hall Ticket Number:

Code No. : 41213

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (EEE) IV Year I-Semester Main Examinations, December-2017
High Voltage DC Transmission (Elective)

Time: 3 hours   Max. Marks: **70**

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2=20 Marks)

1. Define reliability and energy availability in view of HVDC Transmission.
2. Plot graph between cost and distance for HVAC& HVDC and define break even distance.
3. What is meant by neglecting overlap in Graetz in bridge circuit?
4. Define pulse number and write the equation for average output voltage for 6 pulse converter.
5. Sketch the schematic diagram of microprocessor based digital controller.
6. Explain the significance of angle of advance in inverter control.
7. List out different faults in a converter.
8. Mention the reasons for occurring of Non-characteristic harmonics.
9. What are the potential applications of MTDC systems?
10. Draw the diagram for parallel connected radial type and mesh type MTDC system.

Part-B (5× 10=50 Marks)

11. a) Draw and explain the schematic of a single line diagram of a VSC based HVDC converter station?   [6]

    b) Explain the modern technological developments in HVDC technology.   [4]

12. a) Explain rectifier and inverter operation of a 6pulse converter with equivalent circuits.   [5]

    b) A Graetz bridge operates with a delay angle of 15^0. 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) I_d=2000A and (ii) I_d=4500A   [5]

13. a) Explain the constant current control (CCC) with neat circuit diagram.   [5]

    b) Explain the converter control characteristics for rectifier and inverter with neat sketches. [5]

14. a) What are the different types of converter faults and explain the reasons for causes of converter faults?   [6]

    b) Distinguish between characteristic and non-characteristic harmonics?   [4]

15. a) Explain two ACR method for control of MTDC systems   [6]

    b) Discuss series multi terminal HVDC system and its control.   [4]

16. a) Explain the effect of corona losses in AC and DC system and also suggest to improve the corona losses.   [5]

    b) What is the effect of pulse number on output voltage of a converter?   [5]

17. Answer any *two* of the following:
    a) Distinguish between SVC and STATCOM.   [5]
    b) Give the principle of different types of DC circuit breaker schemes. Why is a surge diverter needed across the DC Circuit Breaker?   [5]
    c) Compare series and parallel MTDC systems.   [5]

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