

G 1371

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Seventh Semester

Branch : Electrical and Electronics Engineering

EE 010 706 L01—HVDC TRANSMISSION (Elective II) [EE]

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Why should the electric power transmission be flexible ?
2. Explain monopolar and bipolar links.
3. What is the function of metallic return transfer breaker ?
4. What are the merits of TSC-TCR type SVC over FC-TCR type SVC ?
5. Explain the power modulation in MTDC systems.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. A 6 pulse bridge converter is fed from 220 kV/110 kV transformer with primary connected to 220 kV. Calculate the d.c. output voltage when the overlapping angle is 15° and the delay angle is (i) 30° and (ii) 150°.
7. Explain the different types of DC links.
8. What are the variables on which the DC breakers are characterized ? Explain.
9. Explain the uses of different types of harmonic filters.
10. Describe the current margin method of control in MTDC systems.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.

Each full question carries 12 marks.

11. Enumerate the advantages and disadvantages of HVDC system over HVAC system. Discuss the applications of HVDC system.

Or

12. Analyse the Graetz bridge, neglecting overlap.
13. What are the principles of HVDC link control ? Explain the hierarchical levels in controlling a HVDC transmission line.

Or

14. For a 3-phase bridge rectifier, the transformer secondary leakage reactance is 0.3Ω and the line voltage is 440 V, if the output current is 220 A. Calculate the angle of overlap and the DC output voltage at a delay angle of 15° .
15. What is the principle of surge arrester ? With a neat diagram, explain a typical arrangement of surge arrestors for a converter pole.

Or

16. Discuss the different types of converter faults and the methods of protection.
17. With a schematic diagram, explain FC-TCR and its merits.

Or

18. Discuss the design criteria for AC filters in HVDC systems.
19. Describe the series and parallel MTDC systems and compare them.

Or

20. Using state equations, model an AC network. How it can be interfaced with DC systems ? Explain.

(5 × 12 = 60 marks)