

CBCS SCHEME



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15EE751

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020

FACTS and HVDC Transmission

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define "FACTS Controller". (03 Marks)
- b. Explain the basic types of FACTS controllers, with neat sketch. (07 Marks)
- c. List the possible benefits from FACTS Technology. (06 Marks)

OR

- 2 a. Explain the limitations on transmission line loading capability. (06 Marks)
- b. Enumerate the relative importance of controllable parameters. (06 Marks)
- c. Present in perspective : HVDC or FACTS. (04 Marks)

Module-2

- 3 a. What are the important objectives of shunt compensation? (04 Marks)
- b. With the help of a two – machine system, explain how shunt compensation can help in improving transient stability. (07 Marks)
- c. Explain with suitable sketch, the single phase operation of Thyristor Switched Reactor (TSR). (05 Marks)

OR

- 4 a. Explain with suitable, diagram the switching type VAR generator. (07 Marks)
- b. Why voltage slope is provided in the V – I characteristics of SVC and STATCOM? (04 Marks)
- c. Compare the V – I characteristics of SVC and STATCOM. Any two points. (05 Marks)

Module-3

- 5 a. What are the important objectives of series compensation? (04 Marks)
- b. With neat sketch, explain the concept of series capacitive compensation. (07 Marks)
- c. Write a note on : TSSC. (05 Marks)

OR

- 6 a. Explain with suitable sketch, how voltage stability of a radial system can be improved using static series compensation. (08 Marks)
- b. Explain the operation of Static Synchronous Series Compensation (SSSC) with the help of suitable sketch. (08 Marks)

Module-4

- 7 a. List five important advantages of HVDC. (0 Marks)
- b. Explain with neat waveform the operation of the three phase bridge converter with turn – on angle ' α ' but no overlap. Derive the expression for the average output , direct voltage V_d . (07 Marks)
- c. What is multi – terminal HVDC? What are the different types of multi – terminal HVDC? (04 Marks)

OR

- 8 a. Explain with suitable sketches the different types of two terminal HVDC links. (07 Marks)
b. What are the applications of HVDC? (04 Marks)
c. Explain 12 pulse converter with suitable sketch. (05 Marks)

Module-5

- 9 a. What are the desired features of HVDC control? (05 Marks)
b. Explain with suitable sketches, the control curves of rectifier and inverter in a two terminal HVDC system. Explain the importance of current margin with the combined characteristic. (07 Marks)
c. Explain briefly what is commutation failure. (04 Marks)

OR

- 10 a. Explain with the help of control characteristics how reversal of power flow is achieved in a Line Commutated Thyristor Converter. (07 Marks)
b. Enumerate five important control functions of a HVDC system. (05 Marks)
c. Write a note on : Voltage stability and Reactive Power. (04 Marks)

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