

CBCS SCHEME

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Second Semester M.Tech. Degree Examination, June/July 2019

Facts Controllers

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With neat schematic and phasor diagrams, explain the phase shifting transformer method of conventional control mechanism. (08 Marks)
- b. Describe with neat circuit and phasor diagrams, the concept of load and system compensation of a transmission line. (12 Marks)

OR

- 2 a. With neat sketches, explain the configuration and operating characteristics of saturated reactor (SR) compensator. (10 Marks)
- b. With neat schematic and phasor diagrams, explain the concept of a 12 pulse Thyristor Controlled Reactor (TCR). (10 Marks)

Module-2

- 3 a. With a neat sketch, explain the configuration and operating characteristics of a fixed capacitor – thyristor controlled reactor (FC – TCR) with a step – down transformer. (10 Marks)
- b. With neat sketches, explain the current and susceptance characteristics of a thyristor switched capacitor – thyristor controlled reactor (TSC – TCR). (10 Marks)

OR

- 4 a. Compare different SVC configurations with respect to their losses. (08 Marks)
- b. Explain the advantages of the slope in the SVC dynamic characteristic in detail. (12 Marks)

Module-3

- 5 a. With the help of a neat block diagram, explain the gain supervisor method of improving the SVC response. (10 Marks)
- b. With a neat block diagram, briefly explain the principle of thyristor controlled reactor balance control (TCR BC). (10 Marks)

OR

- 6 a. Briefly discuss the various causes for second harmonic distortion between the thyristor controlled reactor and the AC system. (12 Marks)
- b. Briefly explain the various kinds of resonances found in series – compensated AC system by the application of SVC. (08 Marks)

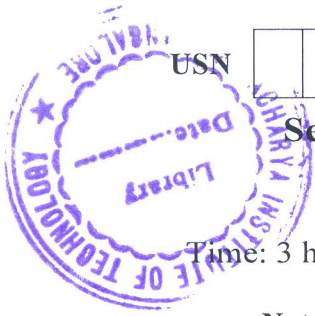
Module-4

- 7 a. Explain the enhancement of transient stability by SVC through power – angle curves. (10 Marks)
- b. With the help of a case study, briefly explain how SVC is employed to prevent voltage instability. (10 Marks)

OR

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



- 8 a. Mention any four advantages of thyristor controlled series capacitor (TCSC). (04 Marks)
b. Bring out the analysis of the thyristor controlled series capacitor (TCSC) with relevant expressions. (08 Marks)
c. Sketch the V – I and X - I capability characteristics for a single module thyristor controlled series capacitor (TCSC). (08 Marks)

Module-5

- 9 a. With a neat block diagram, explain an enhanced TCSC – power – control structure. (10 Marks)
b. Explain the enhancement of system damping using TCSC. (10 Marks)

OR

- 10 a. Explain the principle of operation of static synchronous series compensator (SSSC). (10 Marks)
b. Explain the application of unified power flow controller (UPFC) in power flow control and oscillation damping by taking a case study. (10 Marks)
