CBCS Scheme

USN | | | | | | | | | | |

16/17EPE/EPS24

Second Semester M.Tech. Degree Examination, June/July 2018
FACTS Controllers

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Explain conventional control mechanism of Automatic generation control and excitation control with block diagram. **(08 Marks)**

b. Obtain the midpoint voltage conditions of a symmetrical line as a function of the power flow point. **(08 Marks)**

OR

2 a. Explain synchronous condensers and its main applications. **(08 Marks)**

b. Explain operating characteristics of a Thyristor controlled Reactors without a voltage control. **(08 Marks)**

Module-2

3 a. Explain the fixed capacitor Thyristor controlled Reactor (FC-TCR) configuration and operating characteristics without the step down transformation. **(08 Marks)**

b. Explain mechanically switched capacitor Thyrostor controlled Reactor (MSC – TCR) with different configuration. **(08 Marks)**

OR

4 a. Write the comparison of different Reactive compensators with respect to features. (Any eight). **(08 Marks)**

b. An SVC connected to a 735KV system has reactive power range of 350MVAR production to 100MVA absorption. The droop is set to 4%. The system short circuit level is specified as follows :

i) The maximum short circuit current : 50k.A
ii) The minimum short circuit current under normal operating conditions : 5 KA
iii) The minimum short circuit current during system restoration after loss of a transmission line : 500A form these specification.

1. Determine the per-unit regulator gain that ensured stable operation from 5KA to 50KA system short circuit current.
2. Show the change of voltage control response for the system variation and regulator setting in item 1 of the sub list. **(08 Marks)**

Module-3

5 a. Explain any two methods for improving the voltage controller response. **(08 Marks)**

b. Explain influence of the 2nd harmonic voltage on the TCR with waveforms. **(08 Marks)**

OR

6 a. Explain the effect of the shunt reactor mode on the SVC voltage regulator. **(08 Marks)**

b. Explain with waveform 3rd harmonic distortion. **(08 Marks)**

Module-4

7 a. Explain increase in steady state power transfer capacity. **(08 Marks)**

b. Explain of voltage instability with respect to principles of SVC control A case study. **(08 Marks)**

OR

8 a. Write the advantages of thyristor controlled series capacitors (TCSC). **(08 Marks)**

b. Explain the modes of TCSC operation. **(08 Marks)**

Module-5

9 a. Explain a TCSC constant current (CC) controller model. **(08 Marks)**

b. Explain improvement of the system stability limit. **(08 Marks)**

OR

10 a. Explain the principle of operation of the STATCOM. **(08 Marks)**

b. Explain the application of SSSC in power flow control by taking a case study. **(08 Marks)**

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