Reg. No. : | | | | | | | | | | | | |

Question Paper Code : X60491

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Eighth Semester
Electrical and Electronics Engineering
EE 2036/EE 809/10133 EEE 45 – FLEXIBLE AC TRANSMISSION SYSTEMS
(Regulations 2008/2010)
(Common to PTEE 2036 – Flexible AC Transmission Systems for B.E. (Part-Time) Seventh Semester – EEE – Regulations 2009)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What are the applications of FACTS devices ?
2. Define Reactive Power.
3. Draw the block diagram of SVC voltage regulator in Integrated Current droop form.
4. Draw the power angle curve of SMIB system with midpoint SVC.
5. What are the two basic approaches for controllable series compensation ?
6. Name the different modes of operation of TCSC.
7. State the capabilities of STATCOM.
8. Specify the frequency ranges for electro mechanical oscillation.
9. What is the need for coordination of different FACTS controllers ?
10. Why is it necessary to series-compensate a power system network with multiple SVCs ?

PART – B **(5×16=80 Marks)**

11. a) Explain in detail about Shunt and Series compensation.

(OR)

b) Explain in detail about the classification of different FACTS controllers.

12. a) Discuss the advantage of the slope in SVC dynamic characteristics in detail. **(16)**

(OR)

b) Explain how transient stability is enhanced due to static var compensator. **(16)**

13. a) Explain the operation of TCSC.

(OR)

b) Derive the expression of TCSC for the time interval ($-\beta \leq wt \leq \beta$).

14. a) Explain the operating principle and VI characteristics of shunt switching converter. **(16)**

(OR)

b) With neat phasor diagram analyze the conventional transmission capabilities of UPFC. **(16)**

15. a) Explain the various kinds of control interactions occurring between different FACTS controllers using their frequency response characteristics. **(16)**

(OR)

b) Describe the following linear control techniques used for coordination of control of different FACTS controllers. **(4+6+6)**

i) Linear Quadratic Regulator (LQR)-based technique.

ii) Global coordination using nonlinear-constrained optimization.

iii) Control coordination using Genetic Algorithms.

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