

30/12/16 AN

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**Question Paper Code : 60495**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Eighth Semester

Electrical and Electronics Engineering

EE 2036/EE 809/10133 EEE 45 – FLEXIBLE AC TRANSMISSION SYSTEMS

(Common to PTEE 2036 – Flexible AC Transmission Systems for B.E. (Part-Time).  
Seventh Semester – EEE – Regulations 2009)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the term TCSC.
2. What is meant by passive compensation?
3. What are the advantages of slope in SVC dynamic characteristics?
4. How can the voltage profile be improved by making use of SVC?
5. Mention the disadvantages of fixed series compensation of transmission lines.
6. What are the functions of damping control of a TCSC?
7. List some applications of STATCOM.
8. State the function of converter 1 in UPFC.
9. What is the main problem with multiple SVCs in a power system network?
10. What is the significance of 'modal-performance index'?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Give the complete analysis of lossless distributed parameter transmission lines and derive power equations for symmetrical case. (12)
- (ii) Write a brief note on IPFC. (4)

Or

- (b) (i) What are the objectives of line compensation? Explain the effect of shunt and series compensation on power transmission capacity of a short symmetrical transmission line. (12)
- (ii) List the advantages of SVCs. (4)
12. (a) Draw and discuss in detail about the advantages of slope in dynamic characteristics of SVC. (16)

Or

- (b) Explain the role of SVC in the enhancement of stability under sudden changes in the operating conditions of power system. (16)
13. (a) Explain the working and characteristics of TCSC.

Or

- (b) Explain the variable reactance modelling of TCSC.
14. (a) With neat power circuit and equivalent circuit, describe the working principle of a STATCOM. Explain how the reactive and real-power exchange between the STATCOM and the ac system can be controlled independently of each other. (16)

Or

- (b) Explain the principle of operation and applications of UPFC. (16)
15. (a) What is the need for coordination of different FACTS controllers? Explain the different control interactions that are occurring in multiple FACTS controllers. (2 + 14)

Or

- (b) Describe the following linear control techniques used for coordination of multiple FACTS controllers : (4 + 6 + 6)
- (i) Linear Quadratic Regulator (LQR) based technique
- (ii) Global coordination using non-linear-constrained optimization
- (iii) Control coordination using Genetic Algorithms.