M.E. Second Semester (Electrical & Elect.) (New-CGS)

13293 : Elective-II : Flexible AC Transmission Systems

2 EEEME 5

AW - 3575

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Assume suitable data wherever necessary.
3. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Why a flexible AC transmission system required ? Explain the reactive power compensation of transmission line. 7

   b) State and explain the objective of series and shunt compensation of transmission line. 7

OR

2. a) What is reactive power compensation. Explain working of conventional reactive power compensators. 7

   b) Explain power flow control of transmission line with simple two machine system, with active and reactive power flow phasor diagram and power angle curve for different values of X. 7

3. a) Draw V-I characteristics of SVC and explain its operating modes. 6

   b) Explain applications of SVC also state general advantages of SVC. 7

OR

4. a) How the effective admittance BL varies by firing angle control of SVC ? Explain with the help of basic structure of SVC (TCR&FC) and susceptance vs firing angle plot of SVC and waveforms of SVC. 13

5. a) Draw and explain V-I and V-Q characteristics of SVC and STATCOM. 6

   b) What is transient stability ? Explain improvement of transient stability with midpoint SVC. 7

OR

6. a) Explain merits of hybride compensator. 6

   b) Explain how power oscillation damping and subsynchronous damping can be achieved with SVC. 7

SECTION - B

7.	a)	What is TCSC ? Explain its working with basic circuit elements.	7
	b)	Draw and explain the variation of TCSC reactance with firing angle α.	6

OR

8.	a)	Explain improvement of system stability using TCSC.	7
	b)	State and explain advantages of TCSC.	6
9.	a)	Give construction and working of VSC based shunt compensator with its V-I characteristics.	7
	b)	Explain voltage regulation mode and Var control mode of operation of STATCOM.	7

OR

10.	a)	Explain the working of STATCOM compare its performance with SVC.	7
	b)	Compare STATCOM and SSSC voltage source based shunt and series controller.	7
11.	a)	Draw and explain working of UPFC by two back to back voltage sourced converters.	7
	b)	Explain independent real and reactive power flow control using UPFC of two machine system.	6

OR

12.	a)	Explain functional control of shunt converter and series converter in UPFC.	7
	b)	Give details about basic control system for P and Q control for series and shunt converter.	6

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