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

13293 : Elective-II : Flexible AC Transmission Systems : 2 EEEME 5

P. Pages : 2 | **AW - 3846**

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) What is importance of Reactive power in transmission line? Explain basic principle of power flow in transmission line with simplified model and phasor diagram. **7**

b) Explain Surge Impedance and Ferranti Effect of transmission line. **6**

OR

2. a) Explain necessity of reactive power compensation in transmission line. **6**

b) What are the conventional reactive power compensation mechanisms Explain Any two methods for conventional reactive power compensation. **7**

3. a) What is SVC? Explain objective of SVC, Shunt compensator. Draw and explain the circuit element diagram of SVC (TCR+FC) also state operating V-I area of (TCR+FC) SVC type var generator. **7**

b) Explain effect of variation of firing angle α on fundamental reactor current. **7**

OR

4. a) Explain fixed capacitor, Thyristor-controlled reactor type Var generator and its var demand versus var output characteristics. **7**

b) Give comparison of var generators **7**
i) TCR-FC and ii) TSC (TSR)

5. a) Draw and Explain V-I and V-Q characteristics of STATCOM and SVC also compare the operating zones. **7**

b) With the help of Block diagram Explain transient stability enhancement with SVC. **6**

OR

6. a) Explain power oscillation damping and How it is implemented with SVC and STATCOM. **7**

b) Draw and explain transmitted power versus transmission angle of a two machine system with a midpoint SVC obtained with different var ratings. **6**

SECTION - B

7.	a)	What is meant by TCSC, Write down the expression for equivalent impedance, capacitive and inductive reactance of TCSC also, give the different modes of operation of TCSC.	**8**
	b)	Explain the locations to place TCSC in a power system.	**6**

OR

8.	a)	Derive and explain the series compensation of symmetrical line.	**7**
	b)	Explain the effect of TCSC for enhancement of system damping.	**7**
9.	a)	What is voltage source converter Draw and explain reactive power compensation with help of shunt compensator STATCOM. also explain how active and reactive power can be control with the STATCOM.	**13**

OR

10.	a)	What is Static Synchronous Series Compensator (SSSC) Draw and explain its working operation and different operating modes also state applications of SSSC.	**13**
11.	a)	Derive the expression of UPFC connected at midpoint.	**8**
	b)	Give the block diagram for a basic UPFC control scheme.	**5**

OR

12.	a)	Explain in detail with analysis about the implementation of UPFC using back to back connected VSC with common DC link.	**13**

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