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

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

P. Pages : 2 | **AU - 3406**

Time : Three Hours | Max. Marks : 80

* 0 9 5 2 *

Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Due credit will be given to neatness and adequate dimensions.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

## SECTION – A

**1.** What is Flexible AC Transmission? List out various FACT devices & explain it. **14**

**OR**

**2.** a) Discuss the principle and benefits of FACTS technology. **7**

b) State the principle of conventional reactive power compensators. **7**

**3.** Describe how to increase power transfer capacity of transmission line using ideal mid point shunt compensation. **13**

**OR**

**4.** a) Discuss the effect of series and shunt compensation schemes on power transfer capacity. **7**

b) Explain the operation of any one type of SVC with characteristics. **6**

**5.** Explain in details how transient stability improves using SVC and also explain the dynamic performance of SVC. **13**

**OR**

**6.** a) Explain how power oscillation damping and subsynchronous damping can be achieved using SVC. **7**

b) Compare SVC with STATCOM. **6**

## SECTION – B

**7.** Explain in details the principles of operation of Thyristor controlled series compensator (TCSC), its capability characteristics and control scheme used for TCSC using the block diagram. **14**

**OR**

**8.** a) Explain mitigation of sub-synchronous resonance using TCSC. **7**

b) State and Explain in detail the principle of operation of TCSC. **7**

| | | | |
|---|---|---|---|
| 9. | | State the principle of operation of STATCOM in detail along with P-Q diagram. Derive the state space model of STATCOM also. | 13 |

**OR**

| | | | |
|---|---|---|---|
| 10. | a) | Explain the control scheme for SSSC. | 7 |
| | b) | Describe the capability of SSSC to provide real power compensation. | 6 |
| 11. | a) | Explain the independent real and reactive power flow control UPFC. | 7 |
| | b) | Describe the functional control of the series converter of UPFC. | 6 |

**OR**

| | | | |
|---|---|---|---|
| 12. | | Write a note on 'conventional control capability of UPFC'. Also explain the dynamic performance of UPFC with neat schematic. | 13 |

**********