KADI SARVA VISHWAVIDHYALAYA

M.E. Semester-II

Subject Code:-EEC **Subject Name:-**FACTS & HVDC System

Date:-10/06/2013 **Time:-**10:30 am to 01:30 pm **Total Marks:-**70

Instructions:-

1. Answer each section in separate Answersheet.
2. Use of Scientific Calculator is permitted.
3. All questions are Compulsory.
4. Indicate Clearly, the options you attempt along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section-I

Q-1 **[A]** Prove that the midpoint shunt compensation can significantly increase the Available Transfer Capacity of line (doubling its maximum value) at the expense of a rapidly increasing reactive power demand on the midpoint compensator. **[05]**

[B] Describe LCC Bridge Characteristics **[05]**
- Rectifier
- Inverter

[C] Describe selective harmonics elimination modulation (SHEM). **[05]**

OR

[C] Describe principle of operation of SSSC. **[05]**

Q-2 **[A]** Discuss modelling of TCSC with stability point of view. **[05]**

[B] Discuss principle of operation and characteristics of TCSC. **[05]**

OR

Q-2 **[A]** List the FACTS devices. Give a classification of series and shunt FACTS devices. Mention the advantages of FACTS devices. **[05]**

[B] Explain the construction and working of a Static Voltage Compensator (SVC). **[05]**

Q-3 **[A]** Describe Modelling of TCSC. **[05]**
- Variable reactance model
- Transient stability model

[B] Describe single module and multi module TCSC. **[05]**

OR

Q-3 **[A]** Explain the operation of TCSC and different modes of TCSC. [10] **[05]**

[B] ~~Explain the operation of TCSC and different modes of TCSC.~~ X **[05]**

P.T.O

Section -2

Q-4 [A] Discuss the application of SSSC as a reactive power controller. Draw and discuss the necessary control circuit. [05]

[B] Describe Modern Trends In HVDC Technology. [05]

[C] Explain the significance of a different control modes of TCSC operation. Discuss capacitive- Vernier control and inductive-Vernier control mode for TCSC. [05]

OR

[C] Explain role of phase shifting transformer in FACTS technology. [05]

Q-5 [A] Short note on Pulse Width Modulation. [05]

[B] Explain: Operation of STATCOM and V-I characteristics of STATCOM. [05]

OR

Q-5 [A] Write comparison of AC and DC transmission. [05]

[B[Describe application of SSSC as power flow controller and SSR mitigation. [05]

Q-6 [A] Harmonic Performance of 6- Pulse VSC STATCOM. [05]

[B] Explain Analysis Of 12 Pulse Converters. [05]

OR

Q-6 [A] Write a short note on Operation of UPFC and its Application. [05]

[B] Explain significance of reactive power control. Also compare Series and Shunt Capacitor compensator. [05]