

(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID : MC20

Roll No.

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**M. TECH. (Sem.II)**

**THEORY EXAMINATION 2015-16**

**FLEXIBLE AC TRANSMISSION SYSTEMS**

Time : 3 Hours

Total Marks : 100

**Note** : Attempt questions from each section as per instructions.

**SECTION-A**

1. Attempt ALL questions. Each question carries 2 marks :  $10 \times 2 = 20$ 
  - (a) V-I characteristics of STATCOM.
  - (b) Draw the power angle curve of SMIB system with midpoint SVC.
  - (c) Various recent developments in the UPFC design.
  - (d) Describe sub-synchronous resonance.
  - (e) Modelling procedure of IPFC for Power Flow studies.
  - (f) Advantage and limitation of Thyristor Controlled Voltage Regulator
  - (g) Advantage and limitation of Thyristor Controlled Phase Angle Regulators.

- (h) Write the Importance of FACTS controllers in the power system network.
- (i) Distinguish between reactive power absorbers and reactive power suppliers.
- (j) State the use of frequency response curve in the interaction analysis.

### **SECTION-B**

2. Attempt any two questions. Each question carries 8 marks : (8×2=16)
- (a) What is the basic idea for FACTS Devices in Transmission system and explain the various applications of FACTS devices.
  - (b) Explain the objectives of FACTS controllers in the power system network.
  - (c) Describe Sub-synchronous resonance in Power System.
3. Attempt any two questions. Each question carries 8 marks : (8×2=16)
- (a) What is electric power quality? What are the various causes of power quality problems?
  - (b) Discuss the various modes of oscillations in Power System, specifying their frequency and responsible components.
  - (c) Describe the procedure to locate the FACTS devices in an electrical network.

4. Attempt any two questions. Each question carries 8 marks : (8×2=16)
- (a) Enumerate the modelling of SSSC to enhance the system stability.
  - (b) Explain about the performance of SVC in controlling voltage in a power system.
  - (c) Explain the basic operating principle and characteristics and application of UPFC.
5. Attempt any two questions. Each question carries 8 marks : (8×2=16)
- (a) Describe the principle of operation of a TCSC, clearly indicating the different modes of operation.
  - (b) Explain the modelling procedure of UPFC for power flow studies.
  - (c) Explain about the performance of SVC in controlling voltage in a power system.
6. Attempt any two questions. Each question carries 8 marks : (8×2=16)
- (a) Describe Reference current generation techniques of DSTATCOM.
  - (b) Discuss on the measures taken to reduce the harmonic distortion in the STATCOM outputs.
  - (c) Explain DVR reference voltage generation.

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