Q 8301

M.E. DEGREE EXAMINATION, MAY/JUNE 2006.

Elective

Power Systems Engineering

PS 1623 — FLEXIBLE AC TRANSMISSION SYSTEMS

(Common to M.E. Power Electronics and Drives)

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Flexible AC Transmission Systems.
2. What is Resonance Damper?
3. What do you understand by Sub-synchronous Resonance (SSR)?
4. What are the applications of series compensation?
5. What is the basic principle of operation of UPFC?
6. Distinguish between Thyristor controlled FACTS devices and Converter controlled FACTS devices?
7. Explain variable structure FACTS controller.
8. What is approximate multi-model decomposition?
9. Explain operation of saturated Reactor (SR)?
10. Discuss basic principle of operation of Static VAR systems.

PART B — (5 × 16 = 80 marks)

11. (i) Draw and explain Volt - Ampere characteristic of FC - TCR. And explain how load compensation will be done using FC - TCR. (8)

    (ii) Explain with a neat sketch principle of operation of TCR. Draw the current wave forms at different firing angles. (8)

12. (a) Explain with a neat sketch principle of operation of phase angle regulator and its applications.

Or

(b) With a neat sketch explain principle of operation of TCSC and draw its characteristics.

13. (a) Explain NGH damping schemes for Sub-synchronous Resonance (SSR).

Or

(b) Explain modeling and control of Thyristor controlled series compensator for SSR.

14. (a) With a neat diagram explain how real power and reactive power can be controlled using UPFC.

Or

(b) Discuss in detail implementation of UPFC for any application.

15. (a) How FACTS controllers are utilized to enhance power system transient stability? Explain.

Or

(b) Explain what do you mean by Non-linear variable structure control. Discuss its applications.
