Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MEHP/MEPS/MTPS-102

M.E./M.Tech., I Semester

Examination, December 2016

Power System Dynamics Analysis and Control

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.

ii) All questions carry equal marks.

1. Explain equal area criterion of stability. How it can be used to study the stability of a two-machine system. List the factors determining the stability limit and indicate how it may be improved.

2. a) Define the following (any three) :
   i) Infinite bus
   ii) Mid-term and long-term stability
   iii) Voltage collapse
   iv) Critical clearing angle and critical clearing time
   b) Discuss the various states of operation and system security.

3. What are the basic equations of a synchronous machine? Explain how the detailed models of a synchronous machine are developed using phase variables and application of Park's transformation?

4. Give the classification of different prime-mover control with the help of a functional block diagram. Explain the speed governing system for a hydro-turbine.

5. What is the basic function of a power system stabilizer? Discuss in brief the principle of operation of power system stabilizer giving their structural and timing.

6. Explain the function of a Static-Var-Compensator (SVC), giving a schematic diagram of variable impedance type SVC, discuss its characteristics.

7. a) Explain the state-space description of the excitation system.
   b) Explain the modelling of a transmission line.

8. Write notes on any two of the following :
   a) Load modelling
   b) Analysis of transient stability
   c) Reactive power capability of synchronous machine
   d) Exciters and voltage regulators.

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