Code No: D0701 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
POWER SYSTEM CONTROL AND STABILITY
(ELECTRICAL POWER SYSTEMS)

Time: 3 hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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1. a) Develop the classical model of one machine connected to an infinite bus and state any assumptions are made.
   b) Explain the effect of excitation system on transient stability.

2. a) Derive the modes of oscillations of an unregulated multimachine system.
   b) Explain the voltage regulation with one time lag of regulated synchronous machine.

3. a) Describe the concept of dynamic stability.
   b) Explain the dynamic stability by Routh's criterion.

4. a) What is the need of supplementary stabilizing signals?
   b) Explain the stability aspects using Eigen value approach.

5. a) Discuss the excitation system response with non-continuously regulated system with neat circuit diagram.
   b) Obtain the state space description of excitation system.

6. a) Explain the Type- 3 excitation system with neat block diagram and obtain its state model.
   b) Describe the Lyapunov function for single machine connected to infinite bus.

7. a) Define the following
      i) Voltage stability,
      ii) Voltage instability,
      iii) Voltage collapse and
      iv) Voltage security
   b) Explain how to control of voltage instability.

8. Write short notes on the following
   a) Governor with one time lag of regulated synchronous machine
   b) Zubov's method
   c) Effect of excitation on generator power limits.

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