

Code: EEPC2T3

I M.Tech-II Semester-Regular Examinations-August 2014

**REAL TIME CONTROL OF POWER SYSTEMS
(POWER SYSTEM CONTROL AND AUTOMATION)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

- 1 a) Explain the need of State estimation in power systems?
7 M
- b) Explain the theory of Weighted Least-Squares State Estimation with the help of an example?
7 M
- 2 a) What is Hypothesis Testing and Chi-squared distribution?
7 M
- b) Explain about the Detection and Identification of Bad Measurements.
7 M
- 3 a) Explain how the contingency analysis is done using Sensitivity factors and also draw flowchart.
7 M
- b) Explain the factors affecting Power System Security. 7 M
- 4 a) Distinguish between reliability and security of a power system.
7 M

- b) Briefly discuss the various functions of energy control centre. 7 M
- 5 What is SCADA? Discuss about automatic substation control using SCADA. 14 M
- 6 a) Briefly discuss the factors affecting Voltage Stability? 7 M
- b) What do you mean by Stability margin? How would you develop the criteria of steady state static and transient reactive power stability? Also define the voltage stability margin? 7 M
- 7 a) Find an expression of the power angle at the load bus in a simple line model at voltage stability limit? 7 M
- b) Develop the concept of voltage stability using the method of optimal power flow? 7 M
- 8 Explain the role of PMU in real time environment of power system operation and control 14 M