5. (a) Explain the following terms : **10**

(i) Steady state stability

(ii) Transient stability

(iii) Dynamic stability.

How dynamic stability is different than transient stability ? **10**

(b) How synchronizing torque coefficient and damping torque coefficients effect the power system stability ? Explain. **10**

6. Develop a mathematical model for voltage collapse phenomenon using Model Analysis. **20**

7. (a) What are the function of AVR ? How can it improve transient stability ? **10**

(b) Explain type 0 excitation system. Develop transfer function block diagram for a type 0 excitation system and explain function of each block. **10**

8. Write short notes on the following : **2×10**

(a) Voltagae collapse

(b) Power System Stabilizers.

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W-722

B. Tech. EXAMINATION, Dec. 2017

(Seventh Semester)

(Weekend) (Re-appear Only)

(EE)

EE-W-403

POWER SYSTEM OPERATION AND CONTROL

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) What is the importance of load frequency control ? Develop transfer function Model block diagram for signle area system. Derive transfer function model for each component. **12**

(b) Find the primary ALFC loop parameters for a control area having the following data :

Control area capacity = 20000 MW
Normal operating load = 10000 MW
Inertia constant = 10 sec
Regulation = 6Hz/pu MW

Assume that the load frequency dependency is linear and 1% change in frequency corresponds to 1% change in load. **8**

2. (a) Taking an interconnected system with a Tie line, Define synchronizing coefficient T. Derive Tie line Power deviations in terms of ceofficient T. **10**

(b) Explain Economic Load Dispatch. How this problem is different than Unit Commitment problem ? Explain Economic load dispatch using classical method. **10**

3. What do you understand by optimal hydro-thermal scheduling ? Describe an Approach for optimal scheduling of hydro-thermal systems. Develop necessary Equations. **20**

4. Develop equal area criteria to predict transient stability of power systems ? For a power system, carrying power through a single transmission line, Develop an expression for critical clearing angle when a 3 phase fault occurs at load end of Line and is cleared critical time tcr. **20**