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Code No.: 7132 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. (CBCS : EEE) I-Semester Make up Examinations, March-2017

(Power Systems & Power Electronics)

Power System Stability

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Define steady state stability limit.
2. Mention any four counter measures to avoid voltage instability.
3. Justify any two assumptions made while solving transient stability problem.
4. What do you mean by critical clearing time?
5. Mention the advantages of electrical-hydraulic governors for hydroturbines.
6. Briefly explain about the function of Dash Pot in a governor model.
7. How do you determine the initial values for a multi machine system for calculating 'K' constants?
8. Write the necessity of supplementary excitation control for low-frequency oscillations.
9. Identify the sources contributing to torsional oscillations.
10. List at least four methods to counteract subsynchronous problems.

Part-B (5 × 10 = 50 Marks)

11. a) Explain the factors affecting voltage stability & voltage collapse. [5]
 b) Explain any one method to assess voltage stability of the system. [5]
12. a) Explain the numerical methods used for the analysis of transient stability. [6]
 b) Explain the factors influencing transient stability. [4]
13. a) Describe in detail about the transfer-functions of the tandem-compound single-reheat turbines. [5]
 b) Obtain the potential energy function for UPFC. [5]
14. a) Find the initial steady state values of d and q component currents, voltages and torque angle of single machine infinite bus system for given P_{e0} , Q_{e0} and $|V_{t0}|$. [6]
 b) Explain the procedure for complex frequency- supplementary excitation design. [4]
15. a) Describe about the causes of torsional instability problems in turbine generators. [5]
 b) Explain about the methods of analyzing and mitigating the torsional instability problems. [5]
16. a) Write notes on small signal stability on multi-machine system. [5]
 b) Derive the expression for critical clearing angle when the fault occurs on one of the double circuit lines. Explain the importance of critical clearing angle. [5]
17. Answer any two of the following:
 - a) Write short note on fast valving technique for steam turbines. [5]
 - b) Explain a simple design procedure of a supplementary governor control for low frequency oscillations of a hydroelectric power system. [5]
 - c) Briefly describe about the methods used for the study of Subsynchronous Resonance (SSR). [5]