



- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Illustrate your answers wherever necessary with the help of neat sketches.
  5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
  6. Use of non-programmable calculator is permitted.
  7. Attempt **any five** questions.

1. a) Explain with neat block diagram of excitation system in power system generation. 7  
 b) How does the Excitation system affects the stability limit? What are the limitation of quick response excitation? 7
2. a) What do you mean by synchronizing coefficient? Derive the expression and hence explain the condition of stability. 7  
 b) Derive equation for unregulated synchronous machine and explain effect of 7  
 i) Demagnetization of armature reaction  
 ii) Small change in speed.
3. a) Give the representation of non-linear load for small single model. 7  
 b) Find the modes of oscillation of a three-machine system. The machines are unregulated and classical model representation is used. 7
4. a) Derive two axis model of synchronous machine for salient pole machine. 7  
 b) Explain the active method for islanding detection. 7
5. a) Define voltage collapse? List the factor affecting voltage instability and collapse? 7  
 b) Explain the necessity for islanding? Write method for islanding and discuss advantages and disadvantage. 7
6. a) Explain in detail the implication on power system dynamic performance. 7  
 b) Explain and analyze the comparison of angle and voltage stability. 7
7. a) Distinguish clearly between steady state stability, transient stability and dynamic stability. 7  
 b) Explain the improved model of synchronous machine? Explain in detail SVC model diagram? 7
8. Write short note on **any three**. 14  
 i) Effect of reclosing on transient stability.  
 ii) Point – by – point method for transient stability analysis.  
 iii) SCR of synchronous machine.  
 iv) Angular momentum and inertia constant of synchronous machine.

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