

Computer Application to Power System

Time: Three Hours

Maximum Marks: 70

Note: Attempt one question from each unit. All questions carry equal marks.

Unit -1

1. a) What are the main components of a power system? Explain the modeling of any one of the component.
- b) Explain how do you form yBus using graph theory.

OR

2. a) Describe the function and operation of regulating transformer in power flow studies.
- b) Explain what do you mean by loadability of transmission lines and discuss the characteristic of line loadability.

Unit-II

3. a) What are the control variables of reactive power? Explain.
- b) Describe the effects of shunt and series compensation on the loadability of transmission lines.

OR

4. a) What is a Static Var System? Draw and explain its composite characteristics.
- b) What are the basic types of static reactive power control elements? Describe the principle of operation with characteristic of TCR.

Unit-III

5. a) Describe the significance of sensitivity analysis and derive general sensitivity relations for security analysis.
- b) Explain generation shift distribution factor and line outage distribution factor.

OR

6. a) What is meant by sensitivity factor? Explain the role of compensated shift factor in system security analysis.
- b) Describe how sensitivity relations predict changes in reactive power generation with changes in PV-bus voltage for anticipatory preventive control.

Unit-IV

7. a) Enumerate and explain the power system static security levels.
- b) Describe the concepts of reactive and real power corrective rescheduling.

OR

8. a) Explain the major functions of power system security.
- b) Draw a flow chart for contingency analysis of a power system.

Unit-V

9. a) Describe voltage stability and angle stability of power system and discuss their control variable with example.
- b) What are PV and QV curves? Discuss how voltage stability is monitored using PV curve.

OR

10. a) Describe the concepts of static and dynamic load models.
- b) Write a short note on
 - i) Participation factor
 - ii) Effect of shunt compensation on voltage stability