

2056
B.E. (Electrical and Electronics Engineering)
Sixth Semester
PC-EE-601: Computer Aided Power System Analysis

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

1. (a) Write importance of slack bus.
- (b) What are the different factors affecting transient stability?
- (c) Explain Fortescue theorem.
- (d) What do you mean by area control error in load frequency control?
- (e) Discuss importance of pu system in power system analysis. (5x2)

UNIT - I

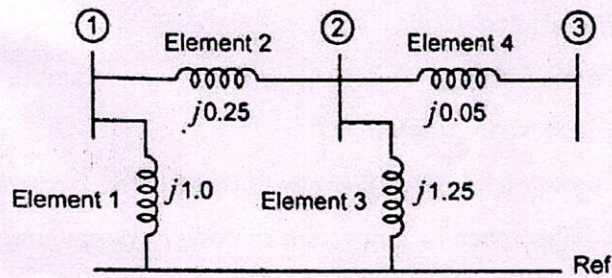
2. (a) Draw and explain flow chart for load flow solution using Gauss-Seidel method considering all types of buses.
- (b) Derive nodal admittance matrix for a 3-bus system. Then develop load flow equations for n-bus system. (5,5)
3. (a) Two generators rated 200 MW and 400 MW are operating in parallel. The droop characteristics of their speed governors are 4% and 5% respectively from no-load to full load. The speed changers are so set that generators operate at 50 Hz sharing full load of 600 MW in the ratio of their ratings. If the load reduces to 400 MW, how will it be shared among the generators and what will be the system frequency? Assume free governor operation.
- (b) Explain LFC. Also, derive expression for frequency and tie-line power for 2-area system using block diagram. (5,5)
4. (a) Derive swing equation. Discuss its applications in the study of power system stability.
- (b) Discuss stability of generator supplying power to a load using equal area criterion when there is sudden decrease in mechanical power from 0.9 to 0.7 pu. Find expression for accelerating and decelerating areas. (5,5)

P.T.O.

(2)

UNIT - II

5. Determine Z-bus using bus building algorithm by adding lines as per increasing element order.



(10)

6. A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a subtransient reactance of 0.25 pu. Negative and zero sequence reactances are 0.35 and 0.1 pu respectively. Find fault current and line-line voltage if following fault occurs at the terminals of alternator (i) L-G fault (ii) L-L fault. (10)
7. (a) Derive expression for fault current and voltages for a generator having fault on its two phases b and c with fault impedance Z_f . Draw sequence network connection.
- (b) Prove that L-L fault at terminals of a synchronous generator with solidly grounded neutral is more severe than three-phase fault. (5,5)

x-x-x