

IV B.Tech I Semester Supplementary Examinations, November 2005
COMPUTER METHODS IN POWER SYSTEMS
(Electrical & Electronic Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. Write short notes on the following:
 - (a) Data for power flow studies.
 - (b) Merits and demerits of using polar and rectangular coordinates in load flow studies.
 - (c) Choice of Acceleration factors. [6+6+4]
2. A sample power system is shown in diagram. Determine V_2 and V_3 by N.R method after one iteration. The p.u. values of line impedances are shown in figure1.

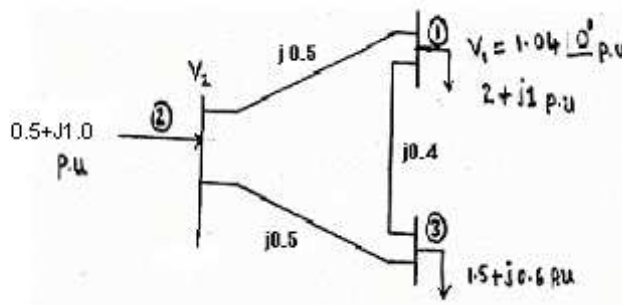


Figure 1:

[16]

3. For the system shown in figure2, find the voltage at the receiving end bus at the end of first iteration. Load is $2 + j0.8$ p.u. Voltage at the sending end (slack) is $1 + j0$ p.u. Line admittance is $1.0 - j4.0$ p.u. Transformer reactance is $j0.4$ p.u. Use the Decoupled load flow method. Assume $V_R = 1 \angle 0^\circ$



Figure 2:

[16]

4. (a) Write the procedure to be followed to calculate the voltage and current during symmetrical fault using Thevenin's Theorem.

- (b) The Thevenin's impedance and voltage at a fault point is $|0.576| \angle 84^\circ$ p.u and $|1| \angle 0^\circ$ p.u. respectively. Determine the short circuit MVA for a base of 30 MVA at 11 KV. [8+8]
5. (a) Develop the expressions for analyzing single line to ground fault in a large power system using "Z Bus" matrix.
- (b) Give a step by step procedure of analyzing a L - L fault on a power system by bus impedance matrix method and explain. [8+8]
6. (a) Define the following terms :
- i. Steady state stability limit.
 - ii. Dynamic state stability limit.
 - iii. Transient state stability limit .
- (b) List the assumptions made in the transient stability solution techniques.
- (c) Derive the expression for steady state stability limit using ABCD parameters. [2+2+2+4+6]
7. (a) Discuss the general considerations and assumptions that are taken into account while studying transient stability.
- (b) Discuss the various techniques adopted to improve transient stability limit. [8+8]
8. (a) What are the steps to be followed for determining multi machine stability?
- (b) Write the state variable formulation of swing equations. [8+8]
