Code No: RR410203 **RR** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
COMPUTER METHODS IN POWER SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is power system stability? Define stability limit of the system.
   (b) Why transient state stability limit is less than steady state stability limit? Explain.
   (c) Draw diagrams to illustrate the application of equal area criterion to study transient stability when a fault on one of the parallel lines of a two circuit line feeding an Infinite bus. The fault is very close to the sending end bus and is subsequently cleared by the opening of faulted line. Mark the accelerating and decelerating areas in the diagram. [6+4+6]

2. (a) Draw and explain flow-chart for N.R. method with polar coordinates.
   (b) Consider the 3-bus system shown in figure 3b. All lines are identical and each can be represented by a series impedance of j 0.1 p.u and shunt admittance of j1 p.u. Obtain $y_{bus,}$. [12+4]

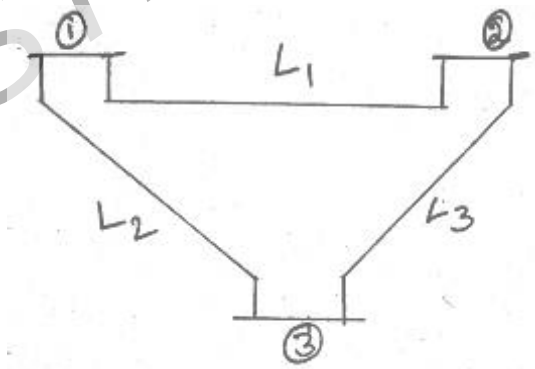

Figure 3b

3. (a) Explain the necessity of load flow studies in power systems.
   (b) Find Y bus for the following 3-bus power system. The series admittances are shown in the figure8b The shunt admittances are : [6+10]
   L1 and ground j 0.3×10^{-3} mhos
   L2 and ground j 0.15×10^{-3} mhos
   L3 and ground j 0.20×10^{-3} mhos

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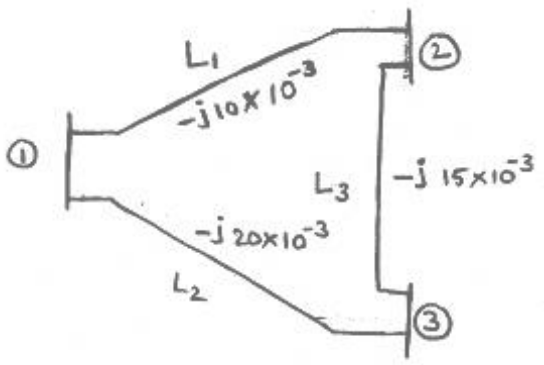

Figure 8b

4. Derive the necessary Equations to study transient stability studies of multimachine systems and explain one of the solution techniques. State the assumptions made, if any in the above analysis. [16]

5. Develop the equations for determining the elements of the H and L matrices in fast Decoupled method from basics. State the assumptions that are made for faster convergence. [16]

6. Derive the equations for fault Current , line Currents , bus Voltages when a three phase fault occurs (which is not grounded) at a bus, using fault admittance matrix in sequence Component form. [16]

7. (a) Develop the expressions for fault impedance matrix in phase and sequence Component form for a three phase to ground fault.
   (b) Develop the expressions for fault admittance matrix in phase and sequence Component form for double line to ground fault occurring on conventional phases and ground. [8+8]

8. (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. [6+4+6]

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Code No: RR410203 **RR** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
COMPUTER METHODS IN POWER SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw and explain flow-chart for N.R. method with polar coordinates.
   (b) Consider the 3-bus system shown in figure 3b. All lines are identical and each can be represented by a series impedance of j 0.1 p.u and shunt admittance of j1 p.u. Obtain y_{bus},. [12+4]

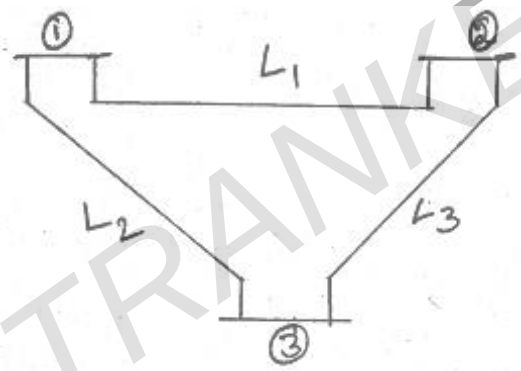

Figure 3b

2. Develop the equations for determining the elements of the H and L matrices in fast Decoupled method from basics. State the assumptions that are made for faster convergence. [16]

3. Derive the equations for fault Current , line Currents , bus Voltages when a three phase fault occurs (which is not grounded) at a bus, using fault admittance matrix in sequence Component form. [16]

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Code No: RR410203 **RR** **Set No. 4**

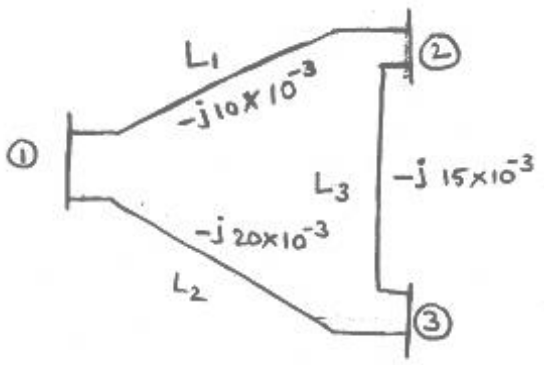

Figure 8b

6. Derive the necessary Equations to study transient stability studies of multimachine systems and explain one of the solution techniques. State the assumptions made, if any in the above analysis. [16]

7. (a) Define the following terms :
   i. Steady state stability limit
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   (c) Draw diagrams to illustrate the application of equal area criterion to study transient stability when a fault on one of the parallel lines of a two circuit line feeding an Infinite bus. The fault is very close to the sending end bus and is subsequently cleared by the opening of faulted line. Mark the accelerating and decelerating areas in the diagram. [6+4+6]

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Code No: RR410203 **RR** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
COMPUTER METHODS IN POWER SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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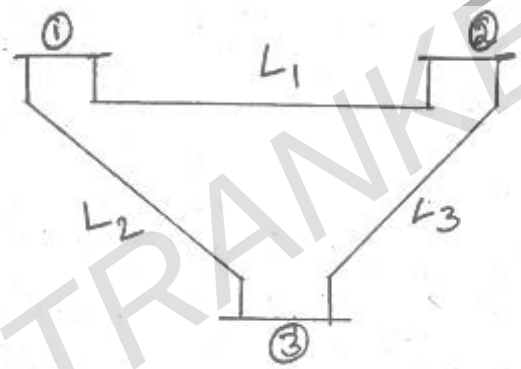

Figure 3b

2. Develop the equations for determining the elements of the H and L matrices in fast Decoupled method from basics. State the assumptions that are made for faster convergence. [16]

3. Derive the equations for fault Current , line Currents , bus Voltages when a three phase fault occurs (which is not grounded) at a bus, using fault admittance matrix in sequence Component form. [16]

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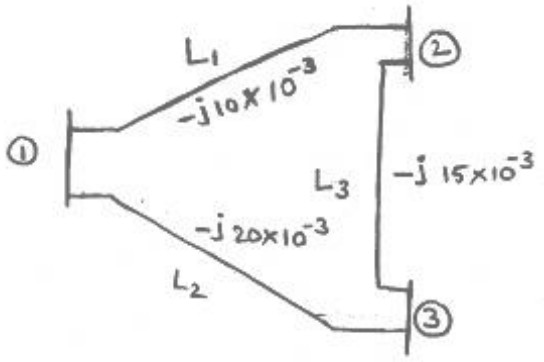

Figure 8b

6. (a) Develop the expressions for fault impedance matrix in phase and sequence Component form for a three phase to ground fault.

   (b) Develop the expressions for fault admittance matrix in phase and sequence Component form for double line to ground fault occurring on conventional phases and ground. [8+8]

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Code No: RR410203 **RR** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
COMPUTER METHODS IN POWER SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

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3. (a) Draw and explain flow-chart for N.R. method with polar coordinates.
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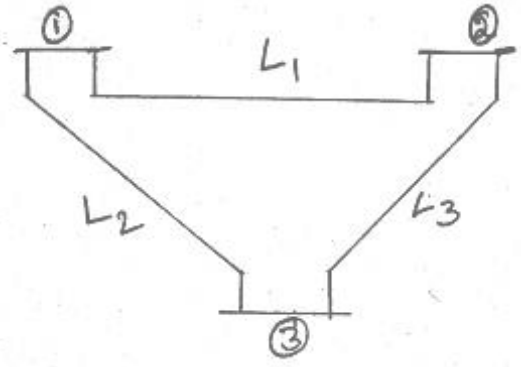

Figure 3b

4. (a) What is power system stability? Define stability limit of the system.
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   (c) Draw diagrams to illustrate the application of equal area criterion to study transient stability when a fault on one of the parallel lines of a two circuit line feeding an Infinite bus. The fault is very close to the sending end bus and is subsequently cleared by the opening of faulted line. Mark the accelerating and decelerating areas in the diagram. [6+4+6]

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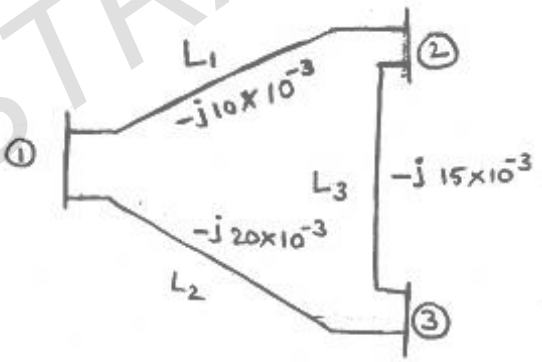

Figure 8b

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