Code :R7410203

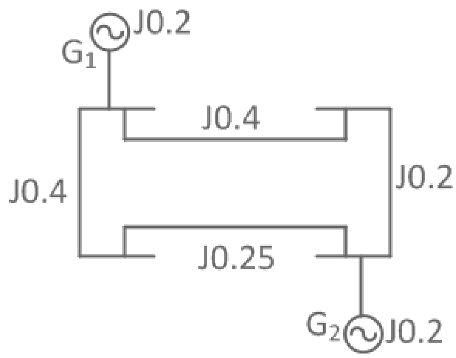
R7

IV B.Tech I Semester(R07) Supplementary Examinations, May/June 2011
POWER SYSTEM ANALYSIS
(Electrical & Electronics Engineering)

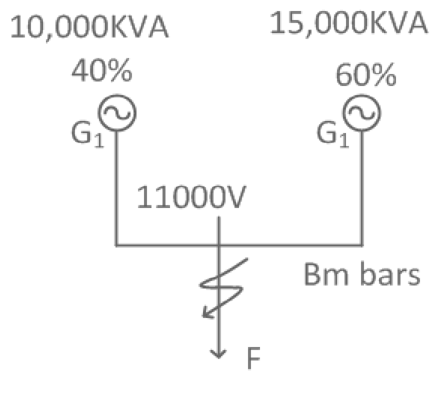
Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Derive the procedure for formation of Bus admittance matrix by singular Transformation method.
   (b) For the given network, form the Y_{BVS} by using singular transformation including the generator bus.



2. Derive the necessary expressions for the building of Z_{BVS} when
   (a) New element is added
   (b) New element is added between two existing buses. Assume mutual coupling between the added element and the elements in the partial network.
3. (a) Explain the classification of various buses in load flow analysis and describe the need for a reference bus.
   (b) Explain the algorithm for Gauss - seidel method load flow solution.
4. Explain clearly with a flow chart of the computational procedure for load flow solution using Newton-Raphson method when the system contains all types of buses. Also write the advantages of the above method.
5. (a) Explain the various types of series reactors and their applications.
   (b) Consider the system shown in figure. The percentage reactance of each Alternator in expressed on its own capacity. Determine the short circuit current that will flow into a dead three phase short circuit at F.



6. (a) What is positive , negative and zero sequence components? Explain their significance.
   (b) The line to ground voltages on the high voltage side of the step up transformer are 100kv, 33kv and 38kv on phases a,b and c respectively. The voltage of phase 'a' leads that of phase 'b' by 100^0 and lags that of phase 'c' by 176.5^0. Determine analytically the symmetrical components of voltage.
7. (a) Derive an expression for the steady state stability power limit.
   (b) Derive the necessary expression for conditions of maximum power transfer between two nodes. Show that their power is maximum when $x = \sqrt{3}R$, where x is reactance and R is the resistance of the systems.
8. (a) Explain point - by point method solving the swing equation.
   (b) Where are the various application of equal area criterion? Explain.

⋆ ⋆ ⋆ ⋆ ⋆