Code No.: 9A02602/R09

B.Tech. III Year II Semester Regular & Supplementary Examinations **Set-1**

April/May - 2013

POWER SYSTEM ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 Hours Max. Marks: 70

*Answer any **FIVE** Questions*

*All Questions carry **Equal** Marks*

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1. (a) Obtain the relationship between number of nodes, number of branches, number of elements and number of links.

   (b) Describe any one method to derive bus admittance matrix.

2. Form Z_{Bus} for the network whose data is given in Table (take bus 1 as reference).

Element	Self		Mutual	
	Bus code	Impedance	Bus code	Impedance
1	1-2	0.6	1-2 (1)	0.2
2	1-2	0.4		
3	1-3	0.5		
4	2-4	0.2	2-4 (4)	0.1
5	2.4	0.4		
6	3-4	0.5		

3. Why direct simulation of load flow is not possible? And mention data required for load flow solution. Also derive simple load flow equations by considering assumptions.

4. Explain decoupled load flow method to find the solution of a system with the help of flow chart.

5. (a) Determine an expression for fault current and MVA in terms of P.U impendence.

   (b) A 3-ϕ 100 MVA, 13.8 kV generator has a subtransient reactance of 15%. Find the MVA_{sc} and I_{sc}.

6. Show that,

   (a) The zero sequence components of line voltages are always zero.

   (b) In the absence of a neutral connection the zero sequence line current is always zero.

   (c) The symmetrical component transformation is power invariant.

7. What do you understand by steady state stability? Discuss in detail about the synchronizing power coefficients.

8. The transfer reactances between a generator and an infinite bus bar operating at 200 K under various conditions on the interconnector are,

   Prefault 150 Ω per phase

   During fault 400 Ω per phase

   Post fault 200 Ω per phase

   If the fault is cleared when the rotor has advanced 60 degrees electrical from its prefault position, determine the maximum load that could be transferred without loss of stability.