

**POWER SYSTEM ANALYSIS**  
(Electrical and Electronics Engineering)

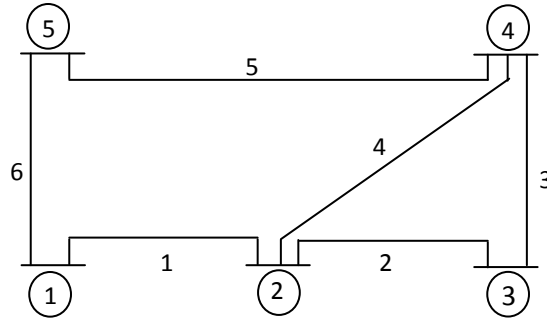
Time: 3 hours

Max Marks: 70

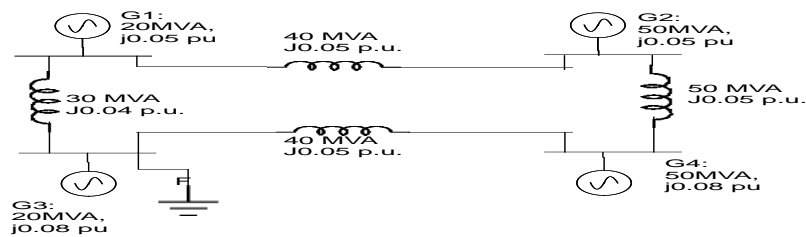
Answer any FIVE questions  
All questions carry equal marks

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- 1 or the network shown in figure given below, draw its graph and mark a tree. How many trees will this graph have? Mark the basic cut sets and basic loops and form the bus incidence matrix A, Branch path incidence matrix K and also the basic loop incidence matrix.



- 2 (a) Explain what do you mean by partial network.  
(b) Explain why often use bus admittance matrix rather than bus impedance matrix in the load flow studies.
- 3 (a) Explain Gauss – Seidel method of load flow solution with flow chart.  
(b) Explain the classification of various buses in load flow analysis and describe the need for reference bus.
- 4 (a) Differentiate FDLF and NR method of load flow solutions.  
(b) Explain dc load flow solution of a power system.
- 5 The four generators are interconnected as shown in figure below. All reactance are referred to their respective MVA and all the generators are solidly earthed. Calculate the short circuit MVA if there is a 3 $\Phi$  short circuit at point F.



- 6 Three resistances of 10, 15 and 20 ohms are connected in star across a three phase supply of 200 V per phase. The supply neutral is earthed while load neutral is isolated. Find the currents in each load branch and voltage of load neutral above earth. Use the method of symmetrical components.
- 7 Discuss the importance of the power system stability study and also briefly express the methods to improve stability.
- 8 The transfer reactances between a generator and an infinite bus bar operating at 200k under various conditions on the interconnector are:
- |              |                        |
|--------------|------------------------|
| Prefault     | 150 $\Omega$ per phase |
| During fault | 400 $\Omega$ per phase |
| Post fault   | 200 $\Omega$ 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.

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