

Reg. No:

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year II Semester Supplementary Examinations Dec 2019**

**POWER SYSTEM ANALYSIS**

(Electrical & Electronics Engineering)

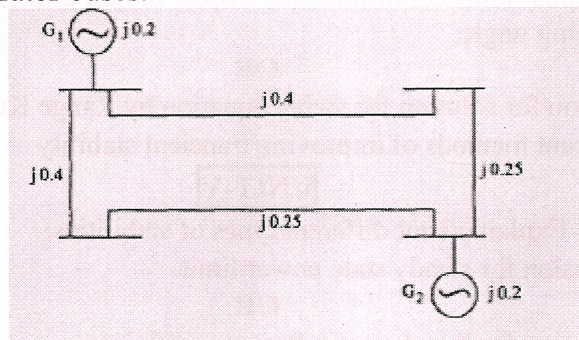
Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 a Define Graph, oriented graph, tree and co tree. 4M  
 b Form the  $Y_{BUS}$  by using singular transformation for the network shown below including the generator buses. 8M



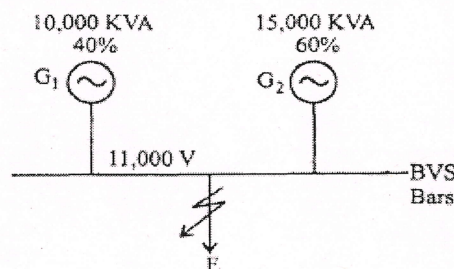
OR

- 2 a Derive the necessary expressions for building up of Z bus when the new element is added between two existing buses. 6M  
 b Develop the  $Z_{BUS}$  using building algorithm for a power system whose element data is given in the following table: 6M

Element No.	Connected between bus No.	Self reactance (p.u)
1	1-2	0.3
2	1-3	0.1
3	2-3	0.2
4	1-2	0.15

**UNIT-II**

- 3 a Define Per Unit system? What are the advantages of Per Unit system? 5M  
 b Consider the system shown in Fig. The percentage reactance of each alternator is expressed on its own capacity determine the short circuit current that will flow into a dead three phase short circuit at F. 7M





OR

- 4 a What is sequence impedance? Explain the sequence network of an unloaded generator. 6M
- b Derive an expression for the fault current for the LG fault. 6M

**UNIT-III**

- 5 a Derive the static load flow equations. 6M
- b Briefly explain the procedure for load flow solution by Gauss Seidel method. 6M

OR

- 6 a Draw and Explain the flow chart for NR method with PV buses presence. 7M
- b Compare Decoupled and Fast Decoupled load flow methods. 5M

**UNIT-IV**

- 7 a Derive the expression for swing equation. 7M
- b A Large generator is delivering 1.0pu power to an initiate bus through a transmission network. The Maximum powers which can be transferred for pre fault, during fault and post fault conditions are 1.8p.u, 0.4p.u and 1.3p.u respectively. Find the critical Clearing angle. 5M

OR

- 8 a Derive the equation for solution for swing equation by Range Kutta method. 6M
- b Explain about recent methods of improving transient stability. 6M

**UNIT-V**

- 9 a What is stability? Explain about different types of stabilities. 7M
- b Derive the expression for steady state power limit. 5M

OR

- 10 a Derive the expression for Synchronous Power coefficient. 6M
- b Explain about power angle curves. 6M

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