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**SUBJECT CODE NO:- H-1792**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**M.E. (Electrical Power System)**  
**Computer Aided Power System Analysis**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

1. Solve any two questions from each section.
2. Assume suitable data if necessary.

**Section A**

- Q.1 a) Explain with neat Flow Chart, Z- bus building Algorithm. 10
- b) Two synchronous machines are connected through three phase transformer & Transmission line, as shown in Figure 'A'. The ratings of machines & Transformers are : 10
- $M_1$  &  $M_2$  : 200 MVA, 20 KV,  $x_d'' = x_1 = x_2 = 10\%$   
 $x_0 = x_n = 5\%$   
 $T_1$  &  $T_2$ : 100 MVA, 20Δ/440YKV,  $x = 10\%$   
 Select base of 200 MVA, 400KV in Transmission line circuit, the line reactance are  $x_1 = x_2 = 15\%$  &  $x_0 = 25\%$ . Draw sequence networks.

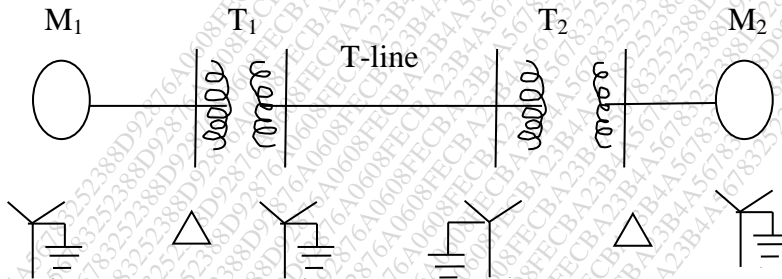


Figure – 'A' Q.1(b)

- Q.2 (a) What are symmetrical components? How are they useful in power system studies? Prove that neutral current can flow only if zero sequence currents are present. 10
- (b) A 10 MVA, 11KV generator is directly connected to a transmission line, a short circuit occurs between two phases involving phase b&c. The Positive, negative & zero sequence reactance are in ohms are given below. 10

Generator	$x_1$	$x_2$	$x_0$
line	27	9	4.5
upto Fault.	9	9	0

Write the note on faults on this known system.

- Q.3 a) Derive Expressions of sequence components for one conductor open fault. Draw the connection diagrams & sequence network for the same. 10
- b) Derive the expression for fault current for LL-fault on phase a & b. 10
- Section B**
- Q.4 a) Derive expression for sequence impedances of transmission line. 10
- b) Explain the sequence impedances of three winding transformer. 10
- Q.5 a) Explain in details the comparison of Admittance & impedance Matrix Techniques. 10
- b) Solve following equations by Newton-Raphson method. 10
- $$x_1^2 - 4x_2 - 4 = 0 \text{ \& } 2x_1 - x_2 - 2 = 0.$$
- Q.6 a) Discuss the generalized fault diagram for shunt faults. 10
- b) Write short note on Kron's transformation matrix method and its applications. 10