

FINAL ASSIGNMENT

Q: 01:

Find the Jacobian of the Transformation

$$x = u^2 - v^2$$

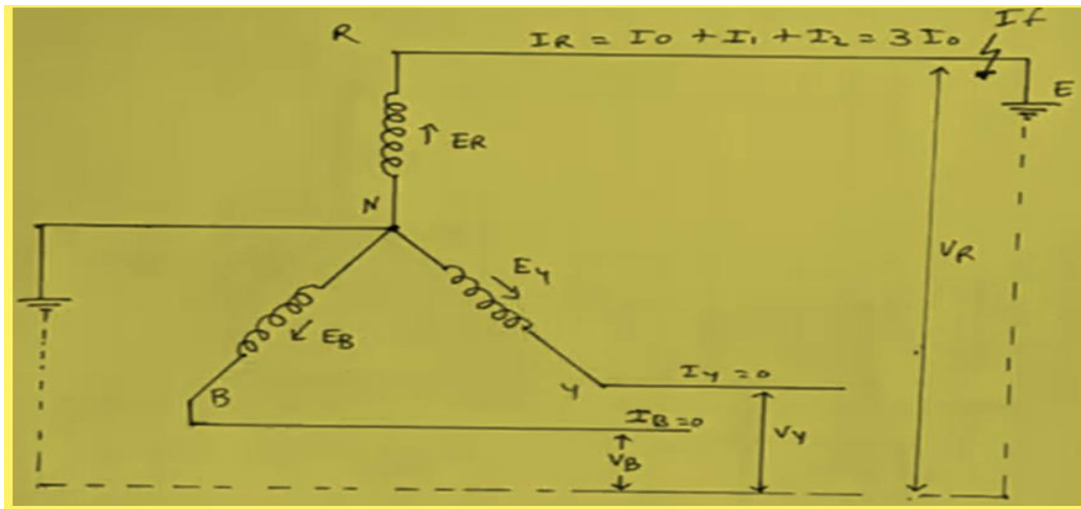
$$y = u^2 + v^2$$

Q: 02:

The Y bus matrix of a 100-bus interconnected system is 90% sparse. Then find the number of non-zero in the Y bus matrix?

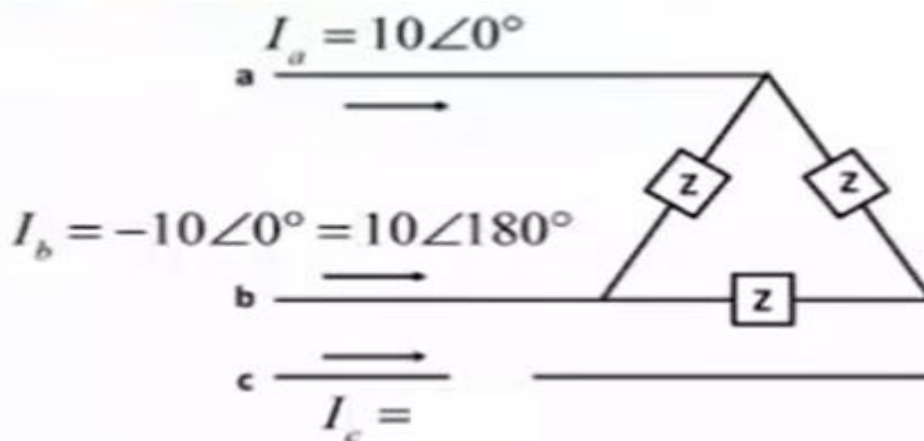
Q: 03:

A three-phase transmission system, a fault occurs on R-phase (or single line to Ground Fault) as shown in Figure below. Calculate the Fault current and draw the sequence network.



Q: 04:

One conductor of a three-phase line is open. The current flowing to the Δ -connected load through line a is 10A. With the current in line a as a reference and assuming that line c is open, find the symmetrical components of the line currents.



Q: 05:

A Y-connected load has balanced currents with abc sequence given by

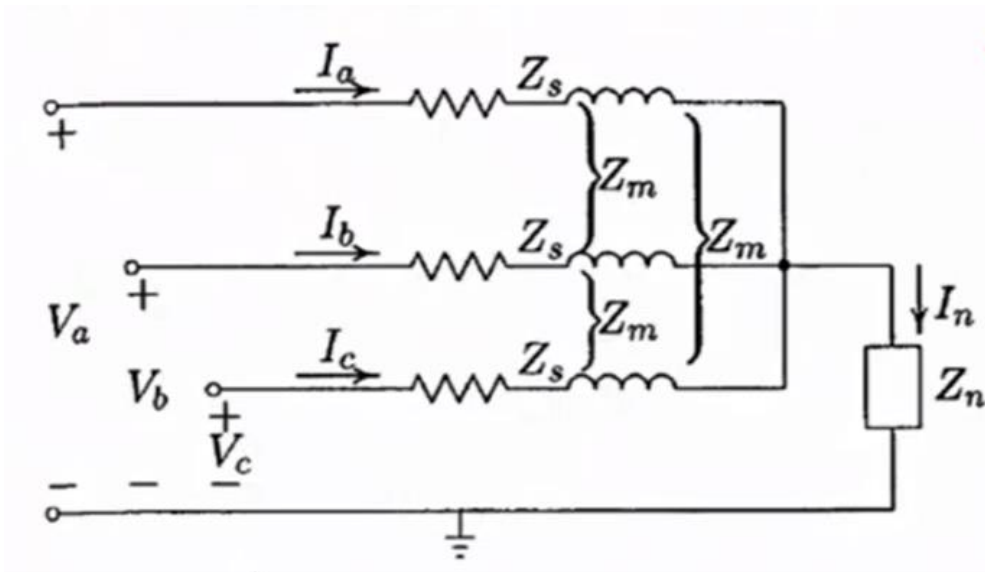
$$I_P = \begin{bmatrix} I_a \\ I_b \\ I_c \end{bmatrix} = \begin{bmatrix} 10 \angle 0^\circ \\ 10 \angle +120^\circ \\ 10 \angle -120^\circ \end{bmatrix} A$$

Calculate the sequence currents (I_0, I_1, I_2)

Q: 06:

Derive the equation of sequence impedances of Y-connected loads

$$Z^{012} = \begin{bmatrix} Z_s + 3Z_n & 0 & 0 \\ 0 & Z_s & 0 \\ 0 & 0 & Z_s \end{bmatrix}$$



Q: 07: Write Short Note

- 1) Define load bus, Generator Bus and Slack Bus and draw its basic diagram?
- 2) State and explain the sparsity in power system analysis?
- 3) Difference between Symmetrical and Unsymmetrical Components
- 4) Positive, negative and zero sequence components and Proof $1 + a + a^2 = 0$
- 5) Derive the Complex power $S_{(3\phi)} = 3 V_a^0 I_a^{0*} + 3 V_a^1 I_a^{1*} + 3 V_a^2 I_a^{2*}$
- 6) Define Sequence Impedance
- 7) Fault and its different types of Faults in overhead Transmission System
- 8) Write the basic three steps of Cholesky's Method
- 9) Give the simple example of Jacobi's Iteration Method
- 10) Write the basic steps of Gauss Jordan Method

THE END