

ELEC-E8422 An Introduction to Electric Energy

Homework 11 – Transformers:

Draw the equivalent circuit of a transformer and explain the function of its different components. Use the primary side as a reference.

Solution of Homework 11

Equivalent circuit of a transformer referred to primary side can be illustrated as in Fig. 1.

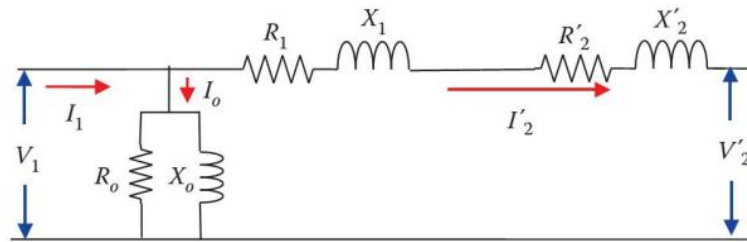


Fig. 1: Equivalent Circuit of a Transformer Referred to the Primary Side

R_1 : Winding resistance of the primary side representing the resistance of the copper

X_1 : Leakage reactance of the primary side

R'_2 : Winding resistance of the secondary side referred to the primary side representing the resistance of the copper

X'_2 : Leakage reactance of the secondary side referred to the primary side

R_0 : Core loss resistance

X_0 : Magnetizing reactance