

Transformer Examples

1. A Transformer operating at no-load draws an exciting current of 6 A when the primary is connected to a 110 V, 50 Hz source. From a Wattmeter test it is known that the iron losses are 167 W. Calculate
 - a. The reactive power absorbed by the core
 - b. The impedance corresponding to the iron losses
 - c. The magnetizing reactance
 - d. The magnetization current
2. A resistive load of 1.6Ω is connected across the secondary terminals of a 10kV/400V transformer. If $R_c = 50K\Omega$, $X_m = 10K\Omega$, $R_{1eq} = 50\Omega$ and $X_{1eq} = 80\Omega$ calculate:
 - i) The turns ratio
 - ii) The output current (I_s)
 - iii) The output voltage under load (V_s)
 - iv) The iron and copper loss
 - v) The magnetising current (I_m)
 - vi) The Input Current (I_p)
3. Open-circuit and short-circuit tests were conducted on a 230/110V 5KVA single phase transformer and the following results were obtained:

Open-circuit Test:

$V_1 = 230V$ $V_2 = 110V$ $I_1 = 2A$ $P_{in} = 30W$

Short-circuit Test:

$V_1 = 40V$ $I_1 = 22A$ $P_{in} = 200W$

Calculate the parameters for the approximate equivalent circuit.