Lecture 64

2. A 5 kVA, 1000/200 V, 50 Hz single-phase transformer has the following OC & SC test data:

No-load test conducted at the low-voltage side:

W0 = 90 W, I0 = 1.2 A, V0 = 200 V

Short-circuit test conducted at the high-voltage side:

Wsc = 110 W, Isc = 5 A, Vsc = 50 V

Calculate the efficiency of the transformer at full-load 0.8 p.f. lagging.

Solution

$$\text{Efficiency , } \eta = \frac{X*VI*cos\Phi}{X*VI*cos\Phi + P_i + X^2_* P_{cu(FL)}}$$

Full load means $x = 1$, $P_i = 90w$

$P_{cu} = 110w$

$$\eta = \frac{1 \times 5000 \times 0.8}{5000 \times 0.8 + 90 + (1)^2 \, 110}$$

$$= 95.23\%$$