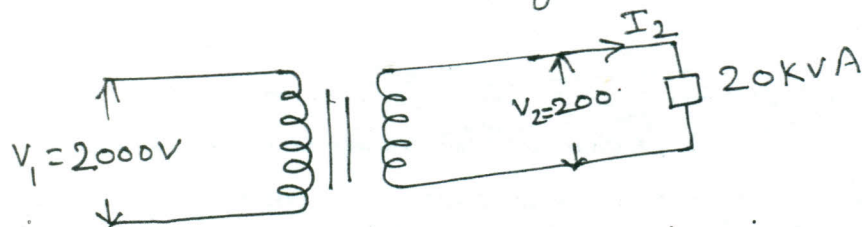


Problems based on xer

(1)

xer IV unit
unit IV

Q1 A 2000/200V, 20KVA xer has 66 turns in the secondary. Calculate (i) Primary turns (ii) primary and secondary load current. Neglect the losses.



Voltage transformation ratio

$$V_2/V_1 = K$$

$$200/2000 = K$$

$$\text{or } \boxed{\frac{1}{10} = K}$$

KVA Rating of xer = 20KVA

$$V_2 = 200V$$

$$\therefore I_2 = \frac{20 \times 1000}{200} = 100A$$

$\therefore I_1/I_2 = K$ (Current ratio are in the inverse of voltage transformation ratio)

$$\therefore I_1 = K I_2 = \frac{1}{10} \times 100 = 10 \text{ Amp.}$$

Q2 A 1 ϕ 2200/250V, 50 Hz xer has net core area of 36cm² and a max^m flux density of 6wb/m². Find the number of turns on primary and secondary.

Ans: $f = 50 \text{ Hz}$, $E_2 = 250$, $V_1 = 2200 = E_1$

$$a = 36 \text{ cm}^2 = 36 \times 10^{-4} \text{ m}^2$$

$$B_m = 6 \text{ wb/m}^2$$

$$\Phi_m = B_m \times a = 6 \times 36 \times 10^{-4} \text{ wb.}$$

$$E_1 = 4.44 f \Phi_m N_1 \quad \text{or } N_1 = \frac{E_1}{4.44 f \Phi_m} = \frac{2200}{4.44 \times 50 \times 6 \times 36 \times 10^{-4}} \Rightarrow 456 \text{ turns}$$

$$E_2 = 4.44 f \Phi_m N_2 \quad \text{or } N_2 = \frac{E_2}{4.44 f \Phi_m} = \frac{250}{4.44 \times 50 \times 6 \times 36 \times 10^{-4}}$$