Q3 The e.m.f per turn of 1φ 10 KVA, 2200/220 V, 50 Hz xer is 10 V. find i) the No of primary and secondary turns (ii) the net cross sectional area of core for a maxm flux density of 1.5 T.

Ans:- $N_1 = \frac{EMF}{EMF\ per\ turn} = \frac{E_1}{EMF\ per\ turn} = \frac{2200}{10} = 220$

EMF induced in primary = E_1 = EMF/turn × No of turns

$2200 = 10 \times N_1$

or, $N_1 = \frac{2200}{10} = 220$ V.

EMF induced in secondary = E_2 = EMF/turn × N_2 (Total No. of turns in secondary)

$E_2 = 10 \times N_2$

$220 = 10 \times N_2$ or, $N_2 = 22$ turns.

Q4 A 3300/250 V, 50 Hz 1φ xer is built on a core having an effective cross sectional area of 125 cm^2 and 71 turns on low voltage side. i) Find the value of the maxm flux density ii) No of turns on high voltage wdg.

$E_1 = 3300$ $f = 50$,

$E_2 = 250$ $a = 125 \times 10^{-4}\ m^2$, $N_2 = 71$

$E_2 = 4.44\, f\, \phi_m N_2$ or, $\phi_m = \frac{E_2}{4.44\, f\, a N_2}$

$= \frac{250}{4.44 \times 50 \times 71}$

$= 0.0158$ Wb.

$K = \frac{250}{3300} = \frac{25}{330}$

$\therefore \frac{N_2}{N_1} = K = \frac{25}{330}$ $N_1 = \frac{330 \times N_2}{25}$

or, $N_1 = \frac{330 \times 71}{25} = 937$ turns.