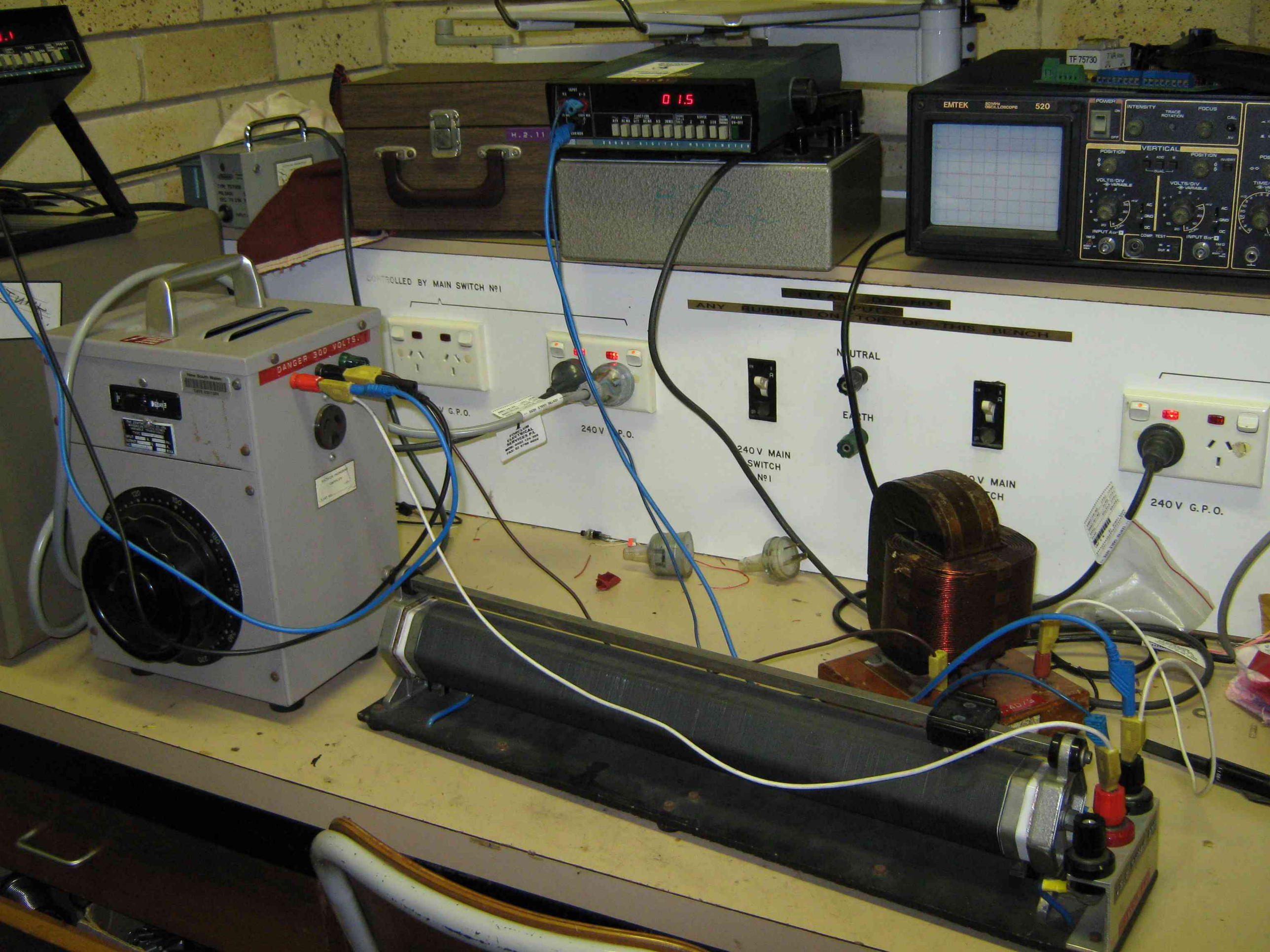

CONTROLLED BY MAIN SWITCH Nº1
240 V G.P.O.
240 V MAIN SWITCH Nº1
NEUTRAL
EARTH
ANY RUBBISH ON TOP OF THIS BENCH
DANGER 300 VOLTS
EMTEK
520
VERTICAL
TF 75730
240 V G.P.O.

H.1.2

INPUT
MA
V-Ω

01.3

FUNCTION
ACV
AC MA
DCV
DC MA
KΩ
20MΩ

RANGE
200MV
200 µA
200 Ω
2
20
200
1200V
2000MA
2000KΩ

POWER
ON-OFF

SIEMENS

8000A DIGITAL MULTIMETER

H.2.11

SWITCH Nº1


INPUT
MA
V
2A FUSE
2V MAX
1200V MAX
COMM
13.1
FUNCTION
ACV
RANGE
200
POWER
ON-OFF
FLUKE
A DIGITAL MULTIMETER
JUNK.
ISOLATE BEFORE OPENING


DANGER 300 VOLTS.
240V G.P.O.
NEUTRAL
EARTH
240V MAIN SWITCH Nº1
240V MAIN SWITCH Nº2
70.2 OHM/4 AMP
BENCH 4A

Gp (31)

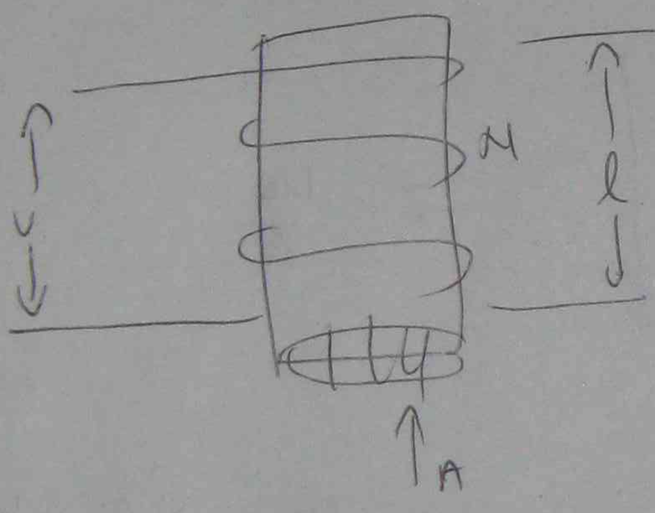
$$HL = NI$$

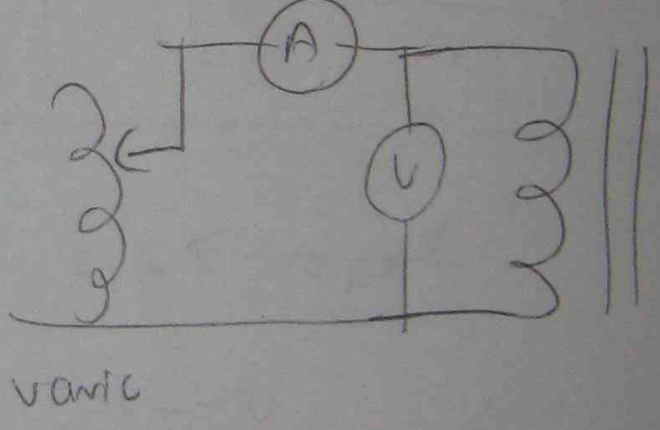
H — magnetising force; L — Length of coil; N — no. of turn; I — current

$$L = \frac{N^2 \mu_0 A_C}{l}$$

L — Inductance; N — no. of turn; A_C — CSA of core; l — Length of coil

count





vario

$$2\pi f L = \frac{V}{I} = X_L$$

$$\therefore L = \frac{V}{2\pi f I}$$

$$\mu = \mu_0 \mu_r$$

$$= 4\pi \times 10^{-7} \mu_r$$

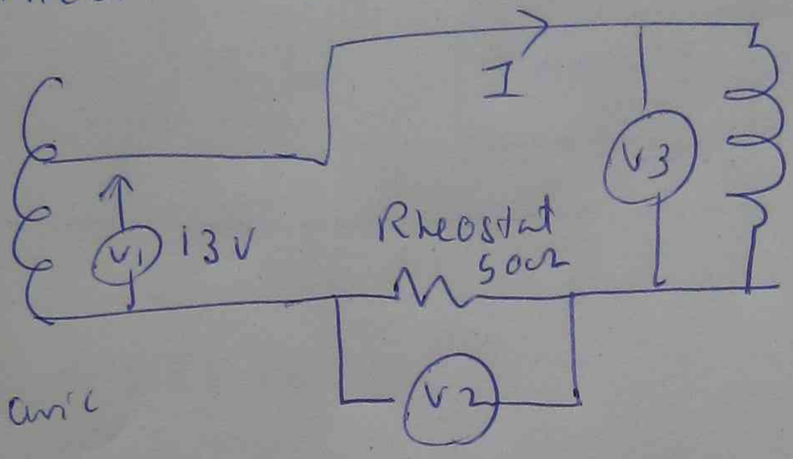
Then find μ_A constat

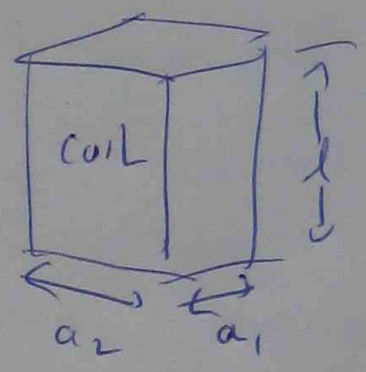
Power Transformer

Ep (31) Magnetic Properties of various Transformer cores

(1) count No. of turns N , measure l & $A = a_1 \times a_2$

(2) connect the given circuit





measure V_1, V_2, V_3

calculate $I = \frac{V_2}{R_{Rheostat}}$

$X = \frac{V_3}{I}$

$L = \frac{X}{2\pi f}$

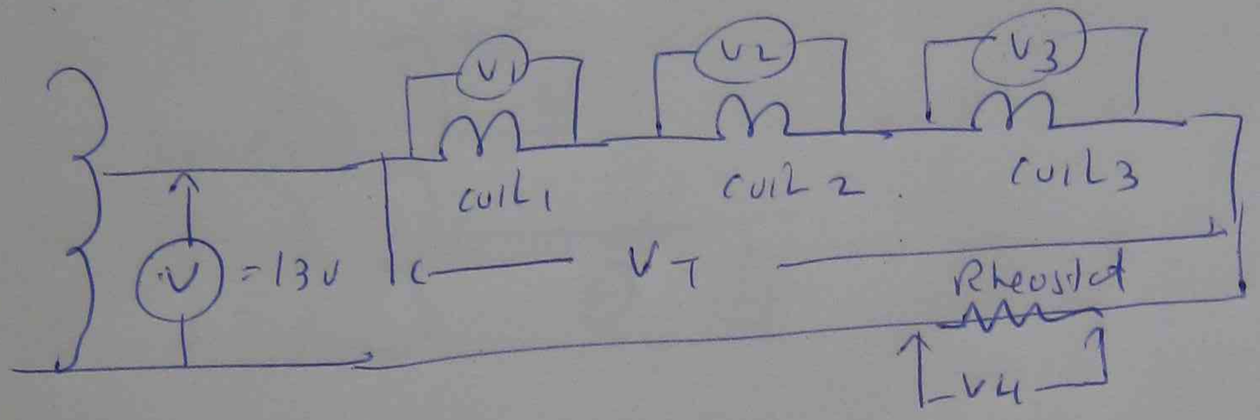
(3) ~~Count diameter~~ calculate $L = \frac{N^2 \mu A}{l}$

(4) $\mu = \mu_0 \mu_r$ substitute $\mu_0 = 4\pi \times 10^{-7}$ and calculate μ_r

Power Transformer

EP33 Properties of series & Parallel connected coils & inductive reactance

(1) Connect the given circuit



Vary R

(2) measure V_1, V_2, V_3, V_4

(3) calculate $I = \frac{V_4}{I}$

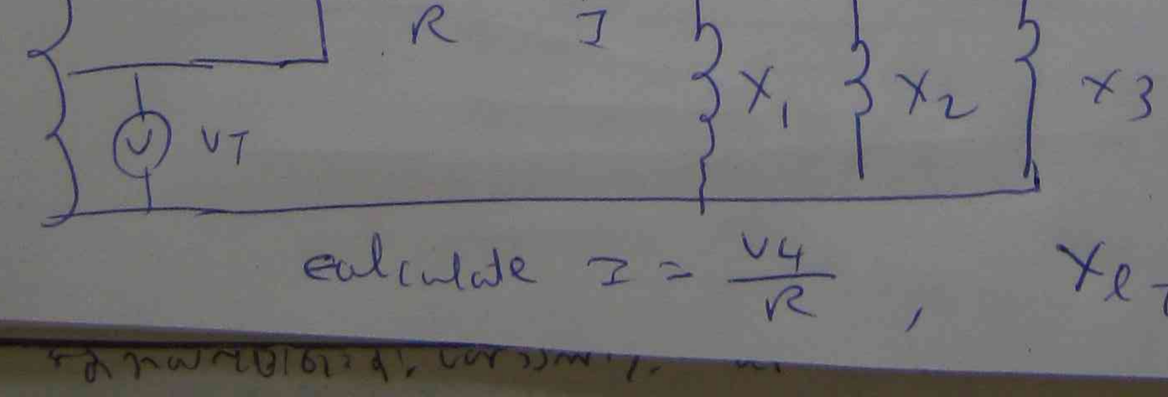
(4) calculate $X_T = \frac{V}{I}$

(5) calculate $X_{l_1} = \frac{V_1}{I}$ $X_{l_2} = \frac{V_2}{I}$, $X_{l_3} = \frac{V_3}{I}$

(6) compare X_T & $X_{l_1} + X_{l_2} + X_{l_3}$

---

(7) connect the given circuit



Take V_T, V_4

calculate $I = \frac{V_4}{R}$, $X_{l_T} = \frac{V_T - V_4}{I}$

RECORDED DATA (II)

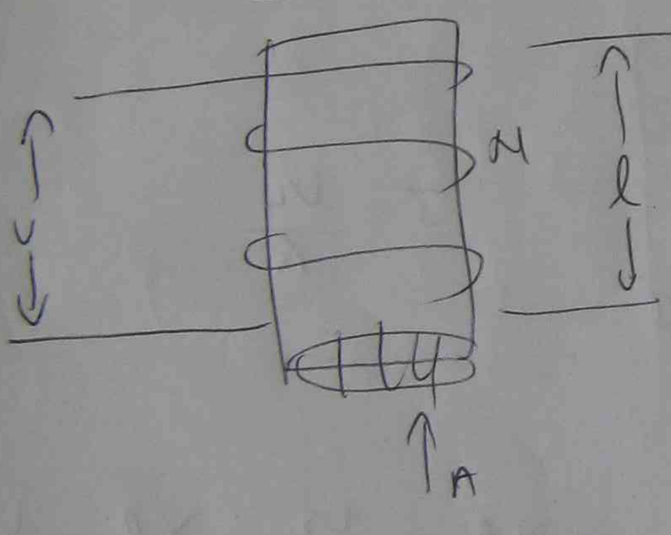
$$HL = NI$$

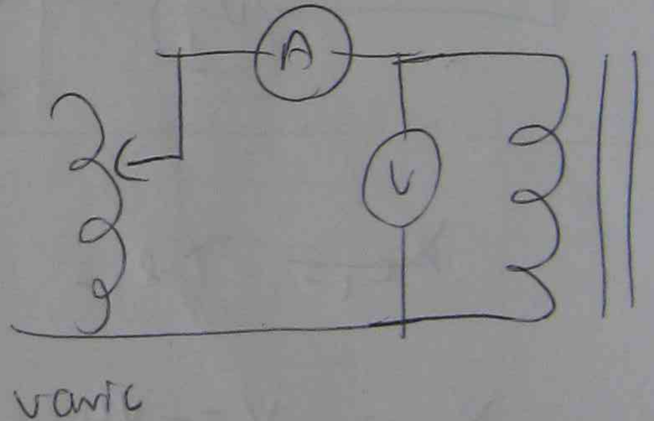
H — magnetising; L — Length of coil; N — no. of turn; I — current

$$L = \frac{N^2 \mu_0 A C}{l}$$

L — Inductance; N — no. of turn; μ_0 — CSA of core; A C — Length of coil

count





varic

$$2\pi f L = \frac{V}{I} = X_L$$

$$\therefore L = \frac{V}{2\pi f I}$$

$$\mu = \mu_0 \mu_r$$

$$= 4\pi \times 10^{-7} \mu_r$$

Then find μ A constat

Required $L = ?$

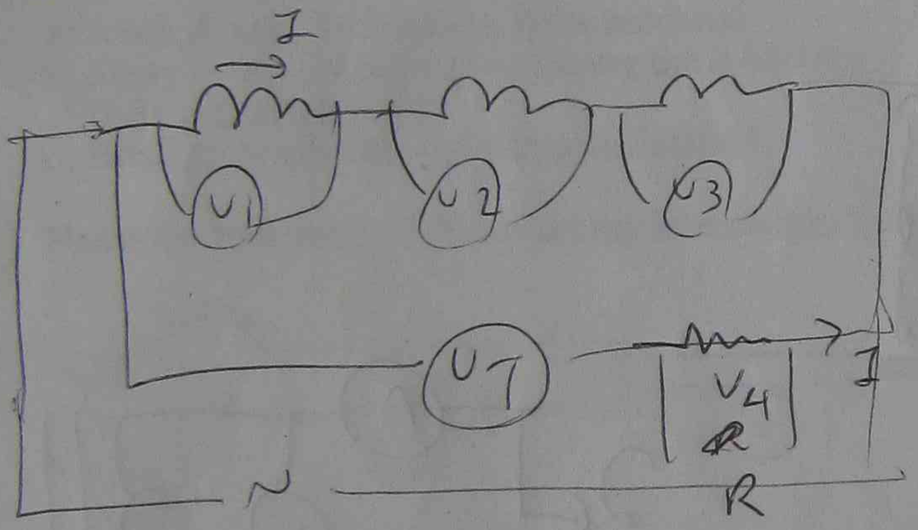
~~Put~~ μ_A

Put ℓ

Calculate N

TEST

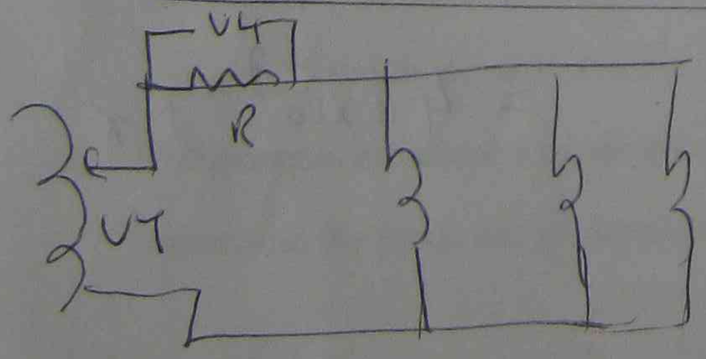
EP (33)



$I = \frac{V_4}{R}$

~~$X_{L_1} =$~~ $X_{l_1} = \frac{V_1}{I}$ $\quad X_{l_2} = \frac{V_2}{I}$ $\quad X_{l_3} = \frac{V_3}{I}$

$X_T = \frac{V_T - V_4}{I}$ $\quad X_{l_1} + X_{l_2} + X_{l_3} = X_{l_T}$ (OR) NOT



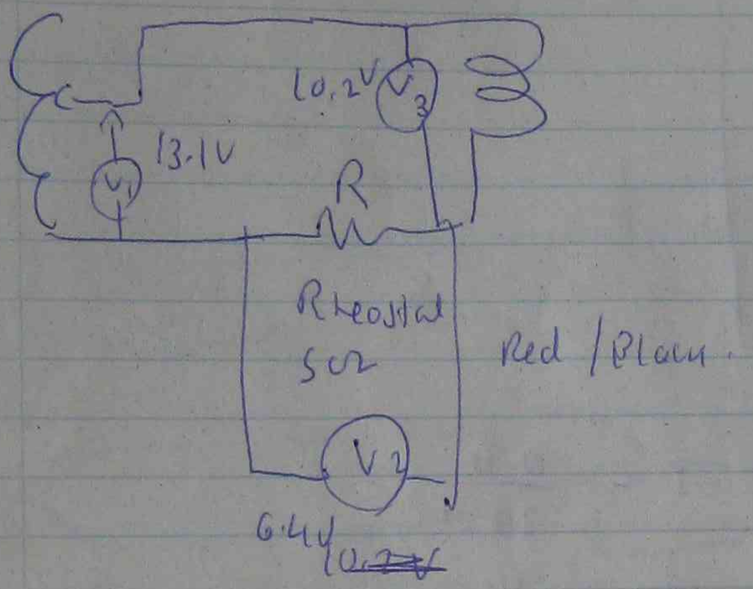
~~$X_{l_T} =$~~ $I_T = \frac{V_4}{R}$

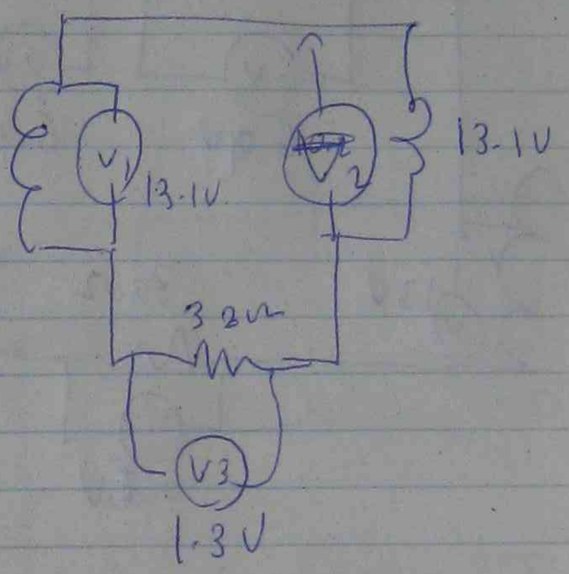
$X_{l_T} = \frac{V_T - V_4}{I_T}$

Compare $\frac{1}{X_{l_T}} = \frac{1}{X_{l_1}} + \frac{1}{X_{l_2}} + \frac{1}{X_{l_3}}$

$50 \times 9 = 450$ (N)

Ep 31





$$I = \frac{1.3}{32} = 0.0342 \text{ amp}$$

$$X = \frac{13.1}{0.0342} = 383\Omega$$

$$2\pi f L = 383$$

$$314 \times L = 383 \qquad L = \frac{383}{314} = 1.21 \text{ H}$$

$$L = \frac{N^2 \mu A}{l}$$

$l = 65 \text{ mm} = 65 \times 10^{-3}$

$A = 50 \times 32 \text{ mm}^2$

$= 50 \times 10^{-3} \times 32 \times 10^{-3}$

$$1.21 = 450^2 \times \frac{\mu \times 50 \times 32 \times 10^{-6}}{65 \times 10^{-3}}$$

$$\therefore \mu = \frac{1.21 \times 65 \times 10^{-3}}{450^2 \times 50 \times 32 \times 10^{-6}}$$

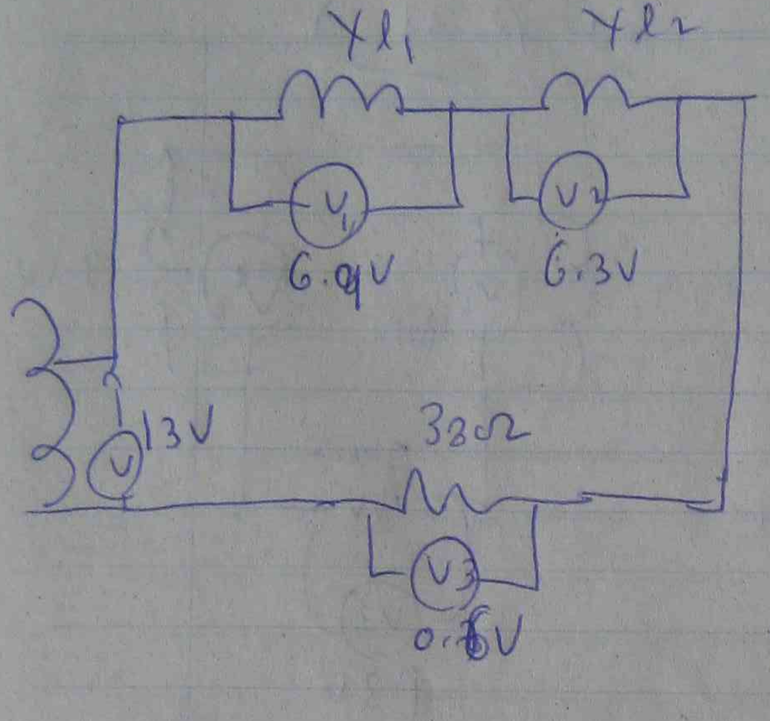
$$= \frac{1.21 \times 65 \times 10^{3}}{450 \times 450 \times 50 \times 32} = 2.42 \times 10^{-4}$$

$$\mu_0 \mu_r = 2.42 \times 10^{-4}$$

$$4\pi \times 10^{-7} \mu_r = 2.42 \times 10^{-4}$$

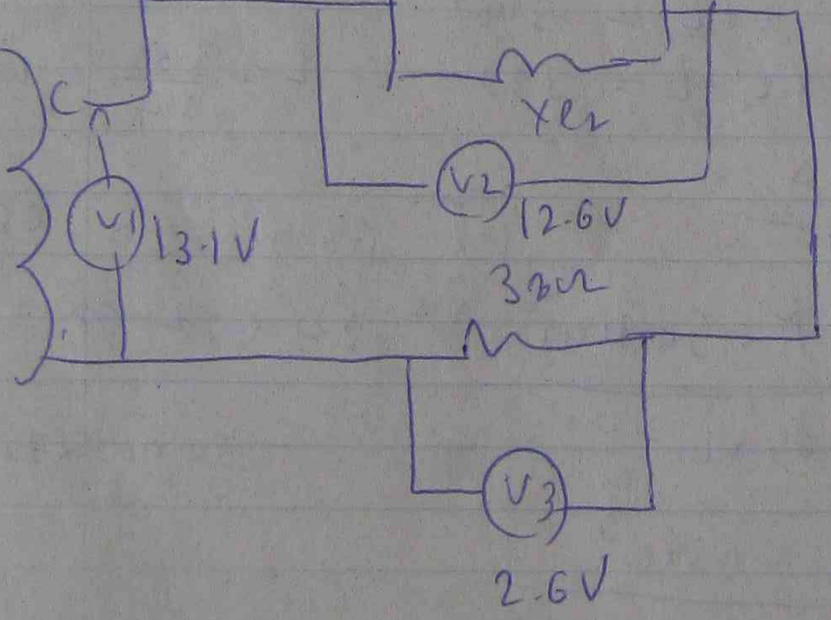
$$\mu_r = \frac{2.42 \times 10^{-4} \times 10^{7}}{4 \times 3.1416} = \frac{2.42 \times 1000}{4 \times 3.1416} = 192$$

EP 33



$$I = \frac{0.6}{33\,\Omega} =$$

$$Xl_1 = \frac{V_1}{I} \quad , \quad Xl_2 = \frac{V_2}{I}$$



$$I = \frac{2.6V}{33\Omega}$$

$$Xl_T = \frac{V_1 - V_3}{\frac{2.6}{33}} = \frac{13.1 - 2.6}{\frac{2.6}{33}}$$

=