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PH: 0402 124

CPBD. 4D/3

CPBD. 4E/3

 $EP(\cdot)$ 



CPBD.40/3

CPBD.4E/3

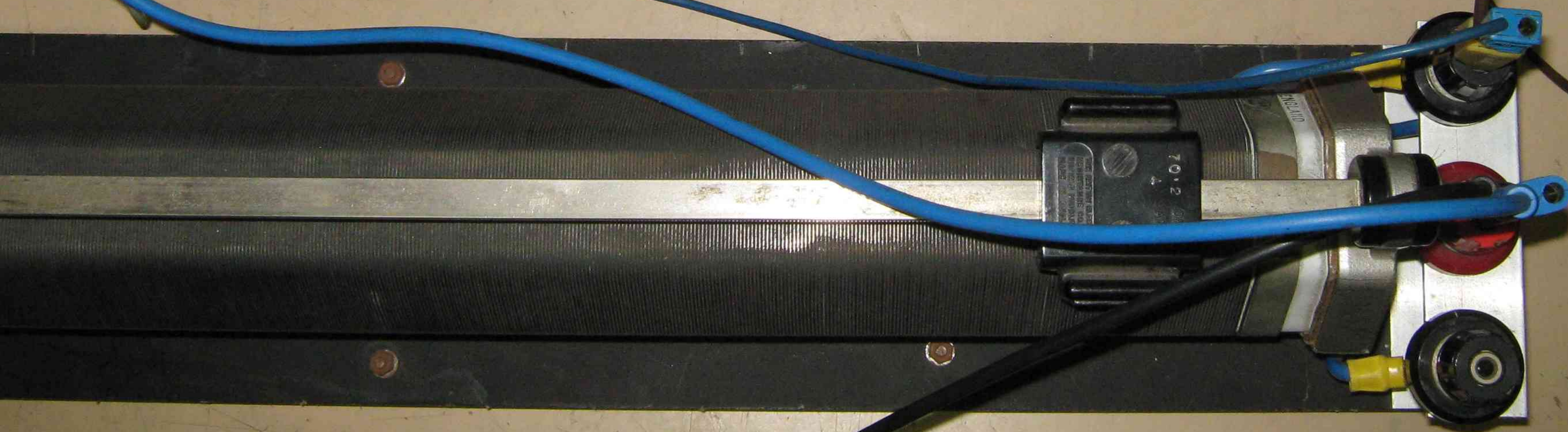
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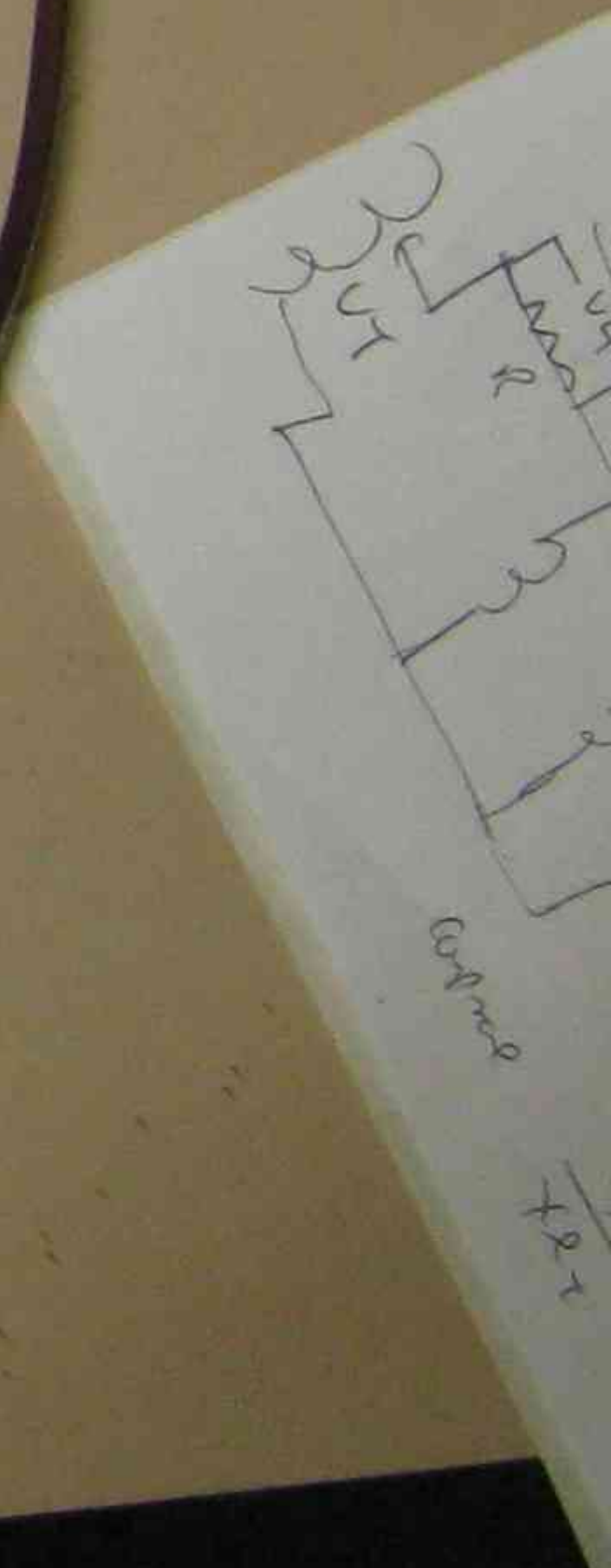
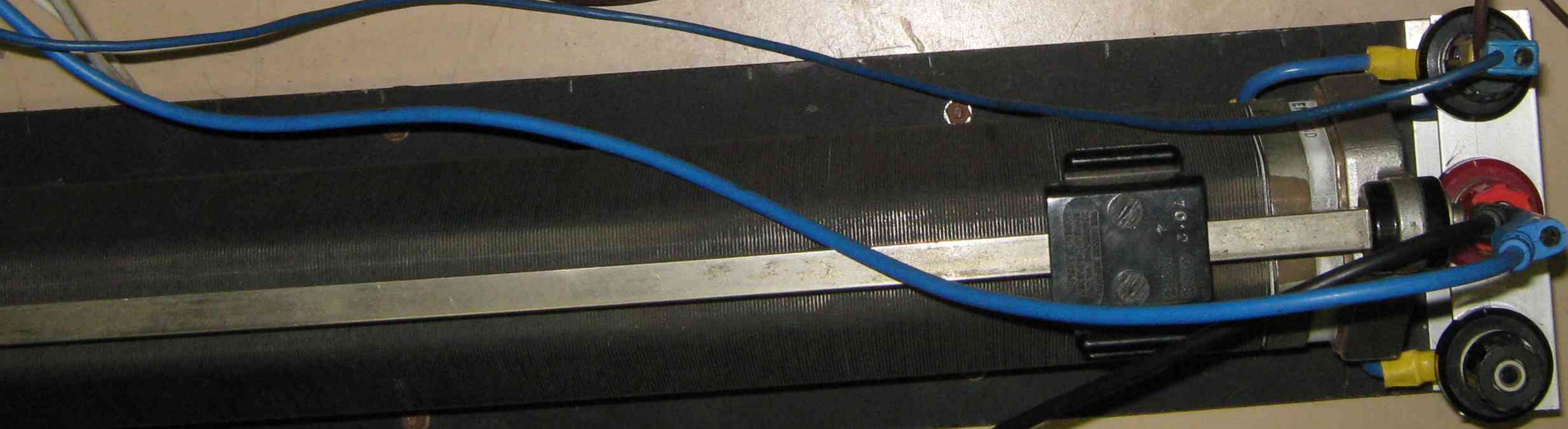
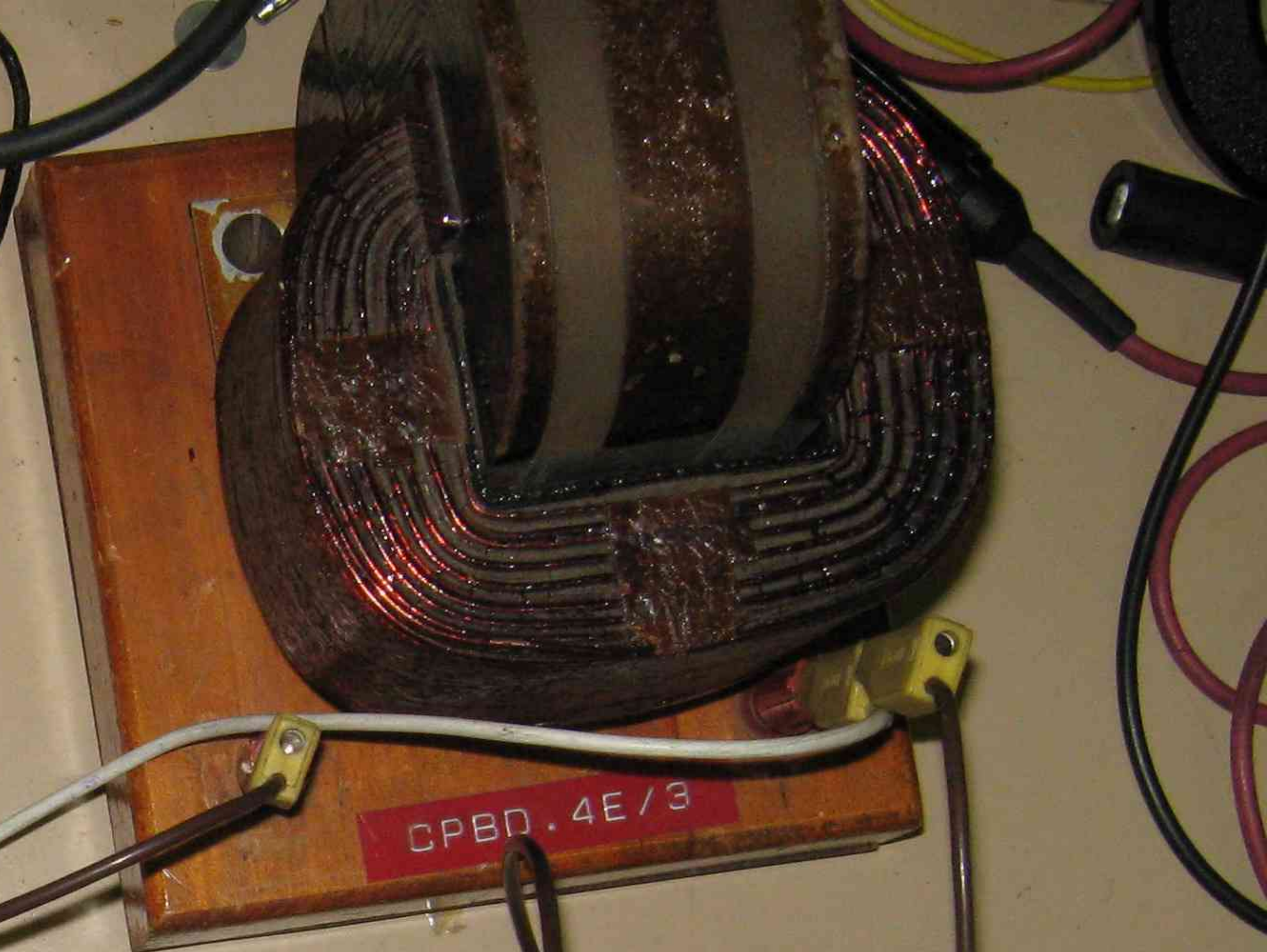
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CPBD. 40/3

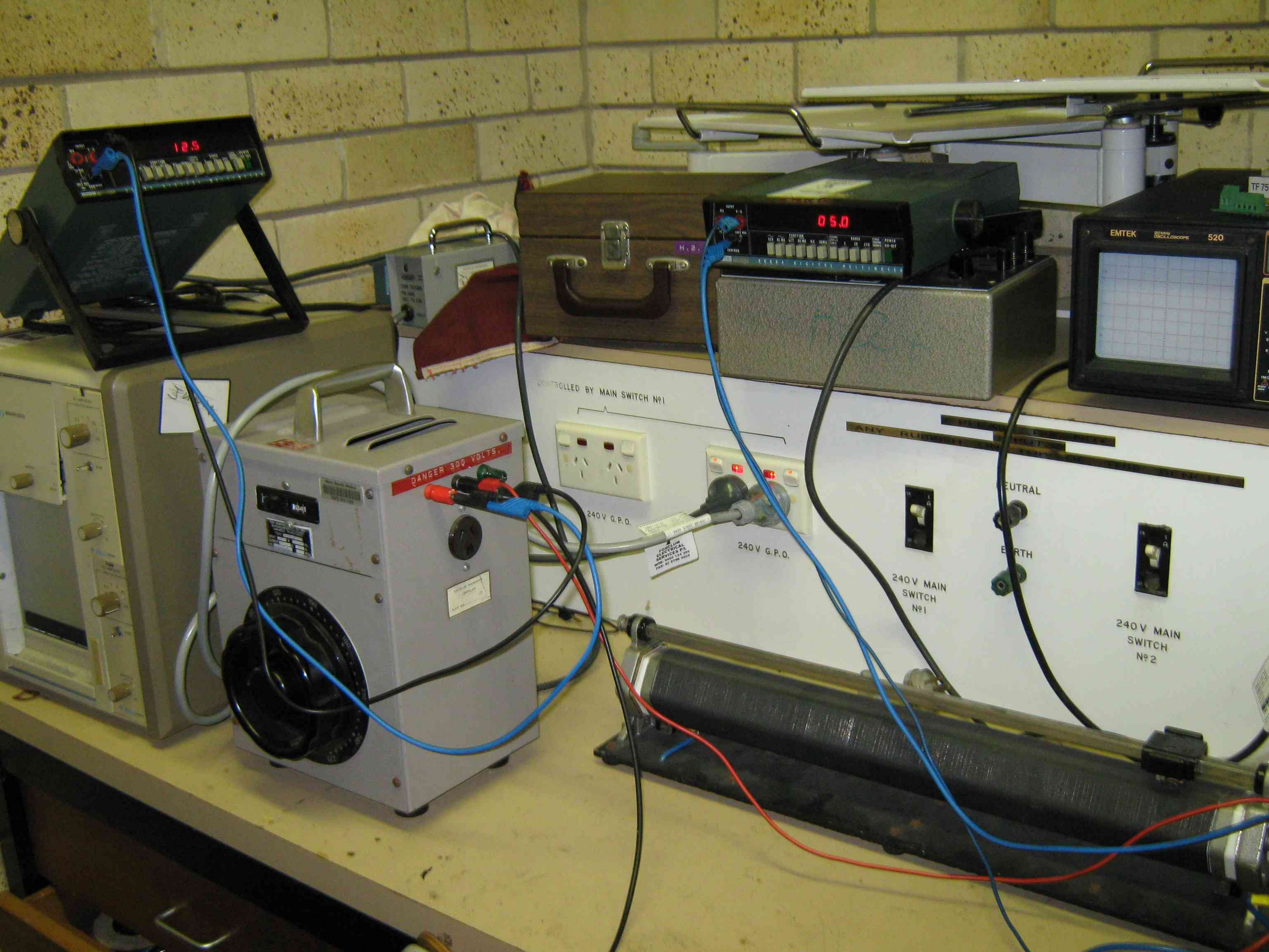
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CPBD. 40/3

Handwritten notes and diagrams on a piece of paper, including a table with columns for 'V', 'I', 'P', 'Q', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z' and rows of calculations and measurements.







Required $L = ?$

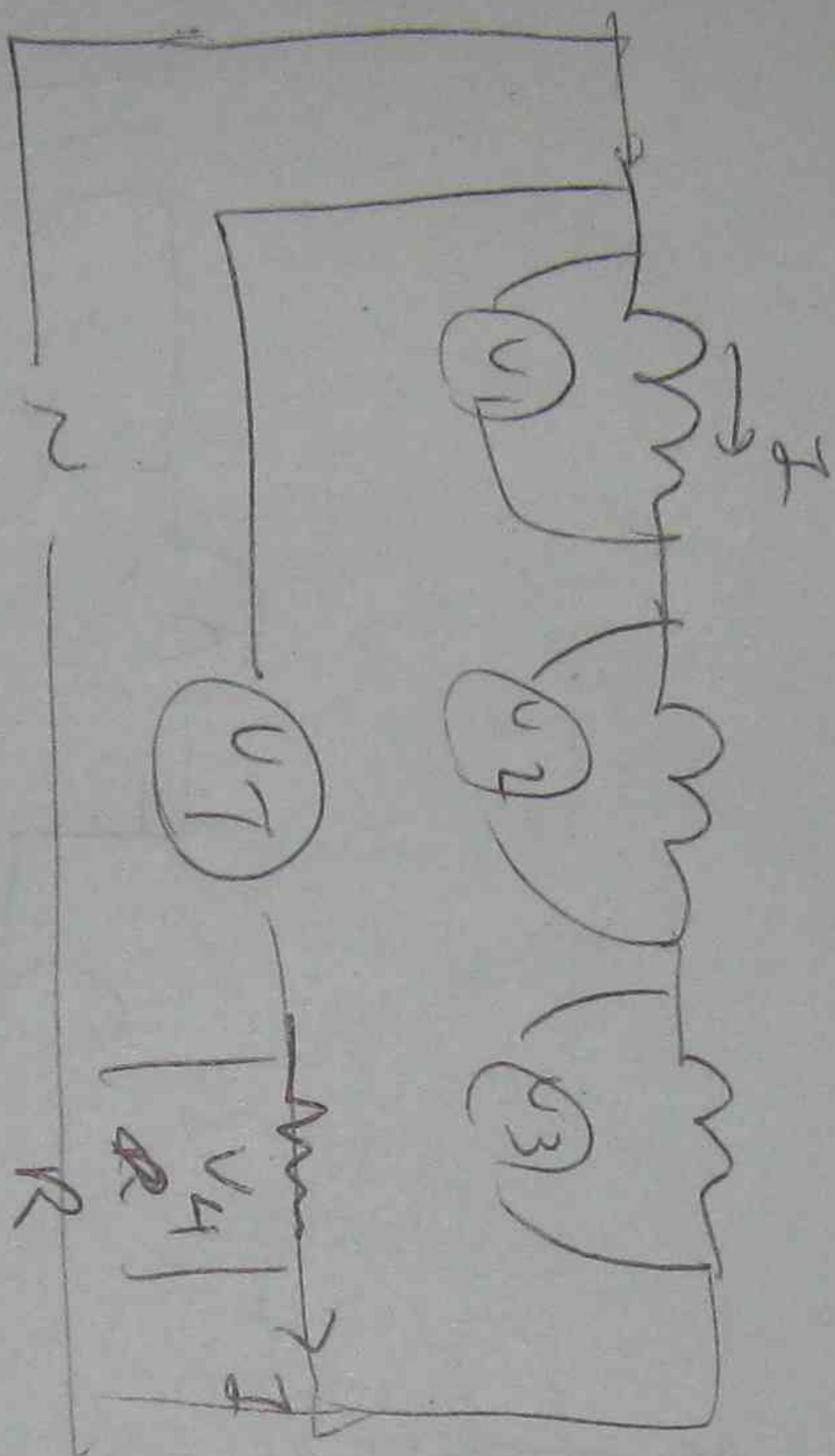
Put P_n

Put L

Calculate M

Test

Ex (33)



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

$$X_{L1} = X_{L2} = \frac{V_1}{I}$$

$$X_{L1} = \frac{V_2}{I}$$

$$X_{L3} = \frac{V_3}{I}$$

$$X_{L1} + X_{L2} + X_{L3} = X_{LT}$$

(or)
not

$$X_{LT} = \frac{V_T - V_4}{I}$$

$$X_{LT} = I_{LT} = \frac{V_4}{R}$$

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

$$\frac{1}{X_{LT}} = \frac{1}{X_{L1}} + \frac{1}{X_{L2}} + \frac{1}{X_{L3}}$$

Compare

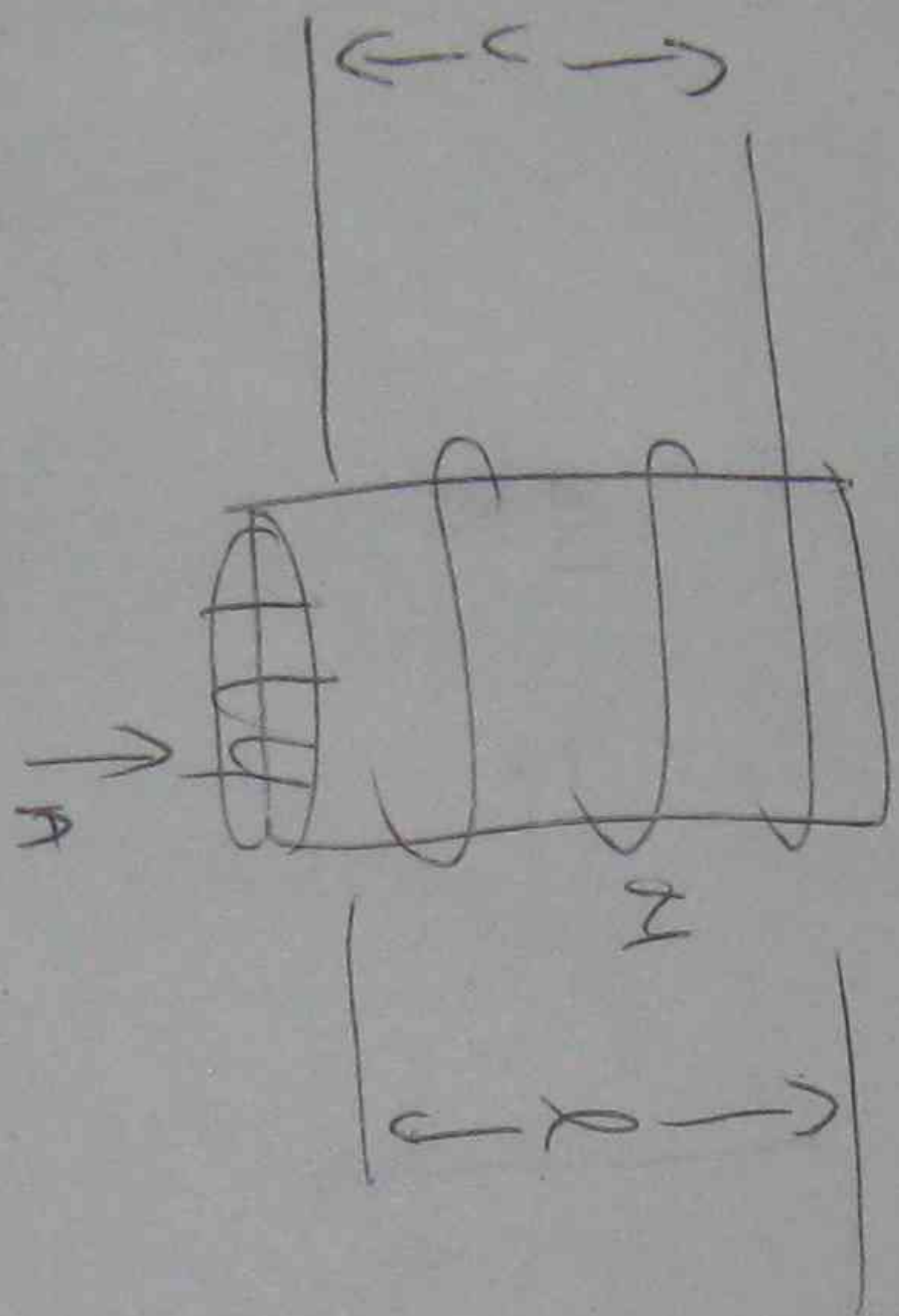
Exp 31

$$HL = NI$$

\uparrow magnetic length
 \uparrow no. of turns
 \uparrow current

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

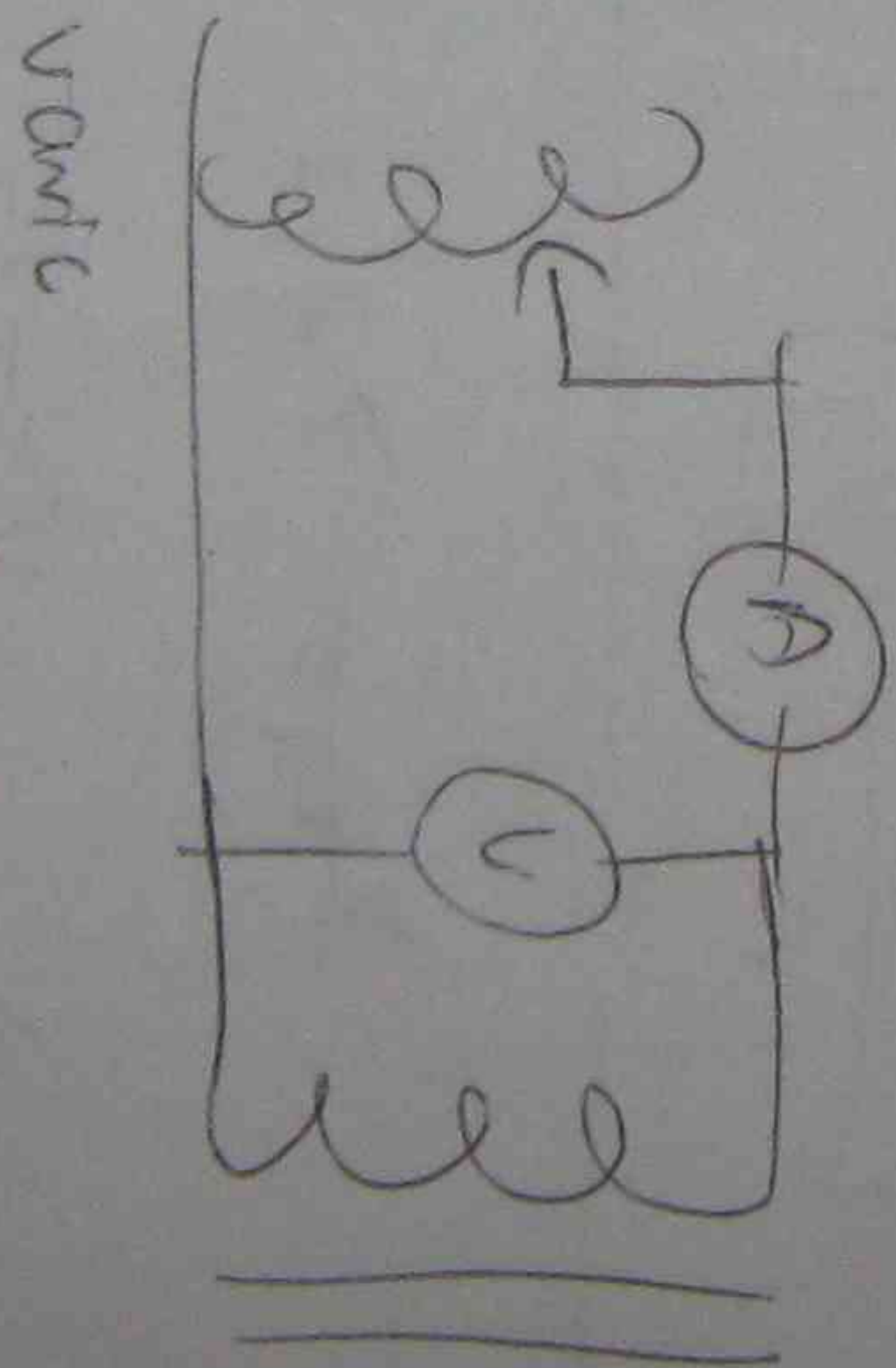
\uparrow Inductance
 \uparrow no. of turns
 \uparrow length of coil
 \uparrow μ_r core of core



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

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

Then find μ_r constant



$$\mu_r = \frac{L}{\mu_0 \mu_r} = 4\pi \times 10^{-7} \mu_r$$

Required $L = ?$

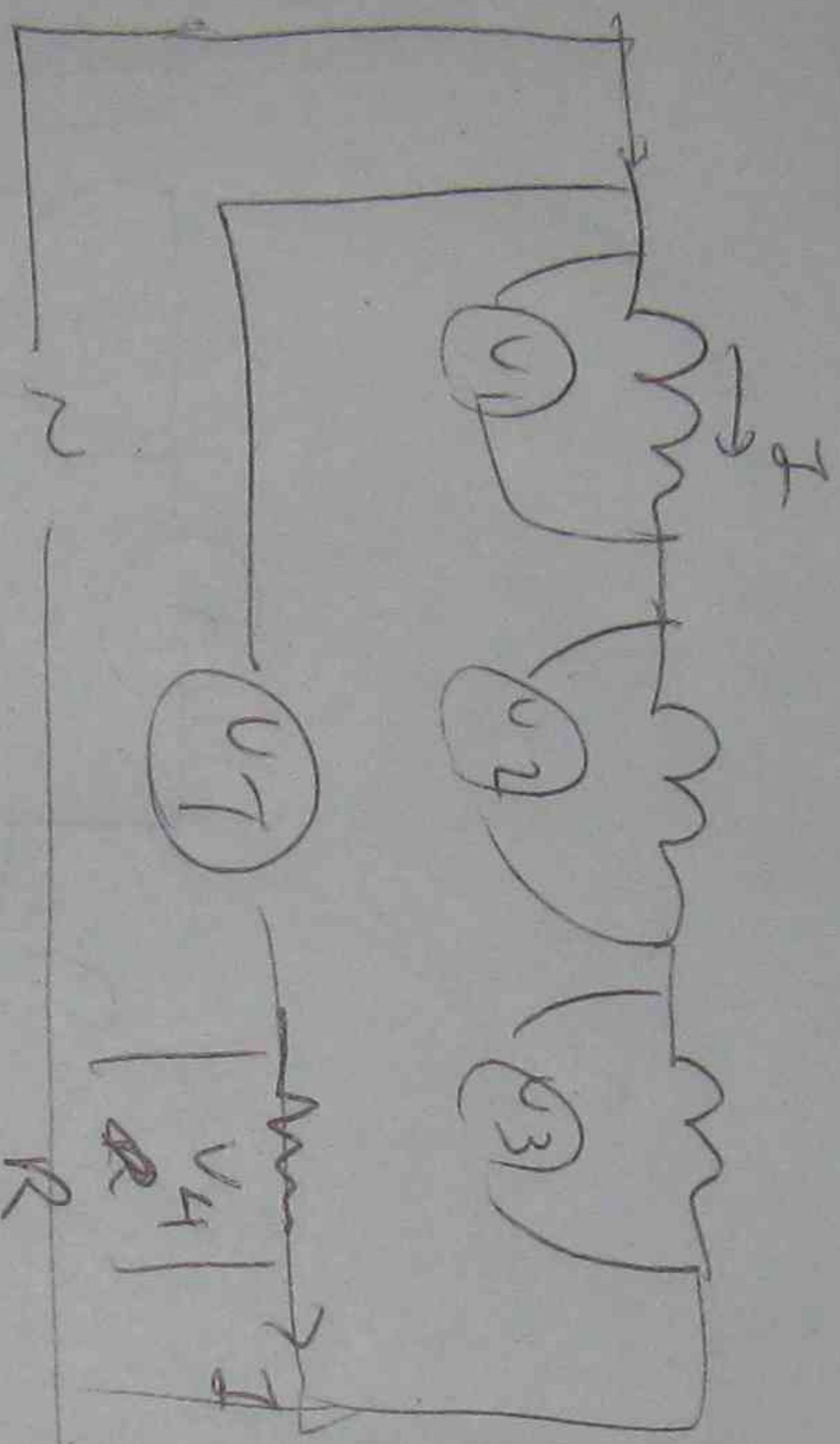
Put P_A

Put L

Calculate M

Test

Exp (33)



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

$$X_{e1} = X_{L12} = \frac{V_1}{I}$$

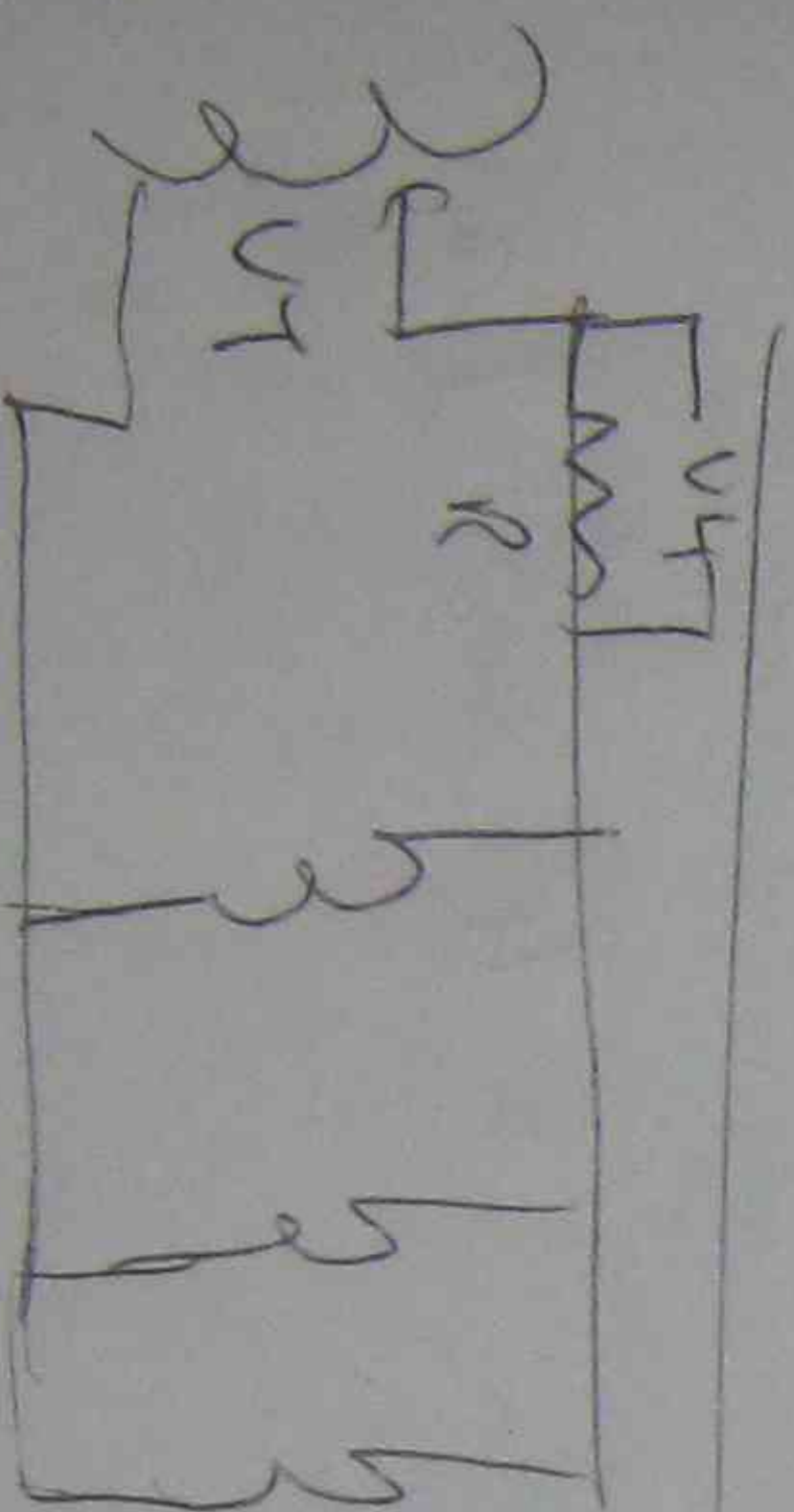
$$X_{L1} = \frac{V_2}{I}$$

$$X_{L3} = \frac{V_3}{I}$$

$$X_{T2} = \frac{V_T - V_4}{I}$$

$$X_{L1} + X_{L2} + X_{L3} = X_{LT}$$

(or) n_{OT}



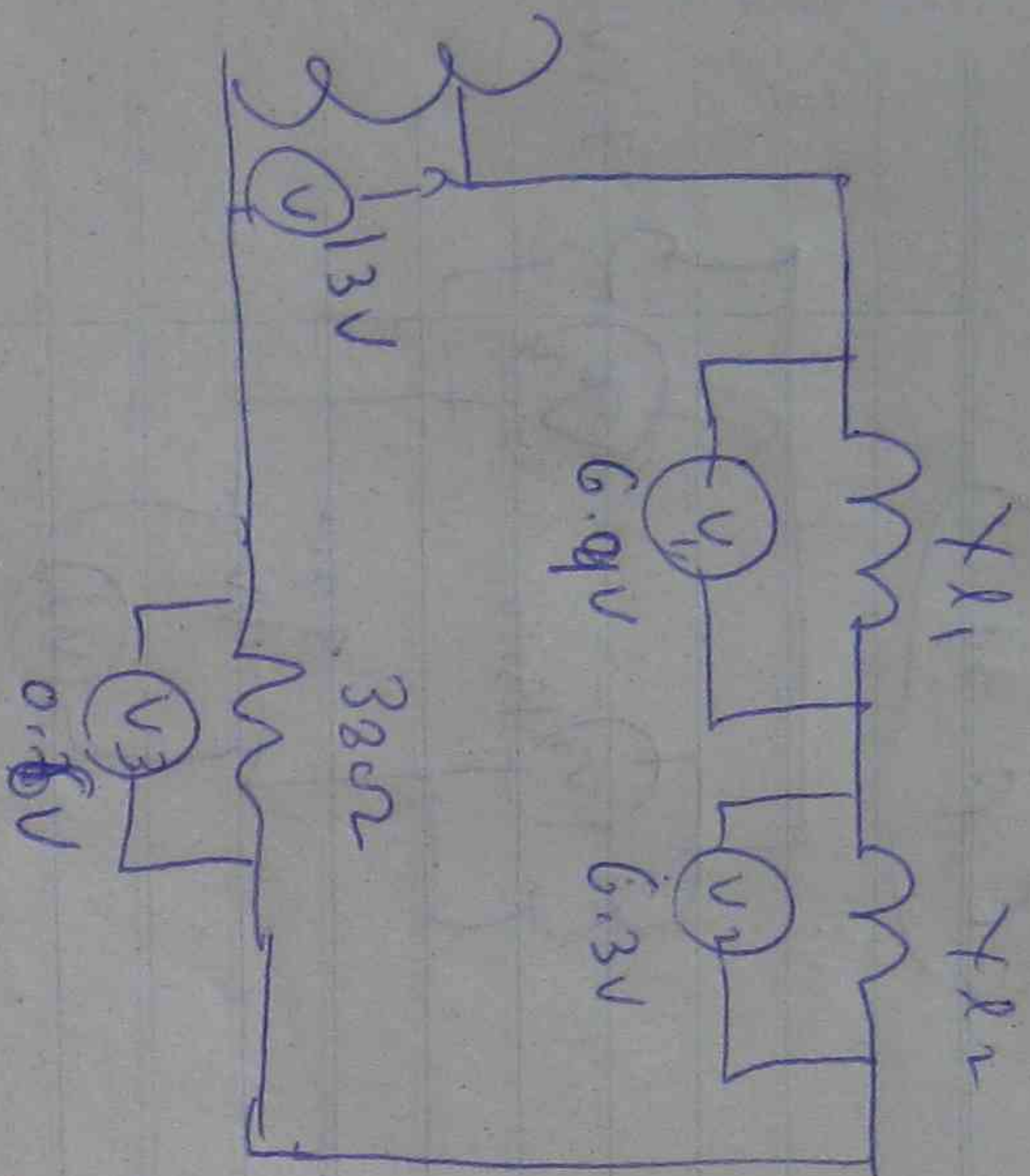
Compare

$$X_{LT2} = I_{T2} = \frac{V_4}{R}$$

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

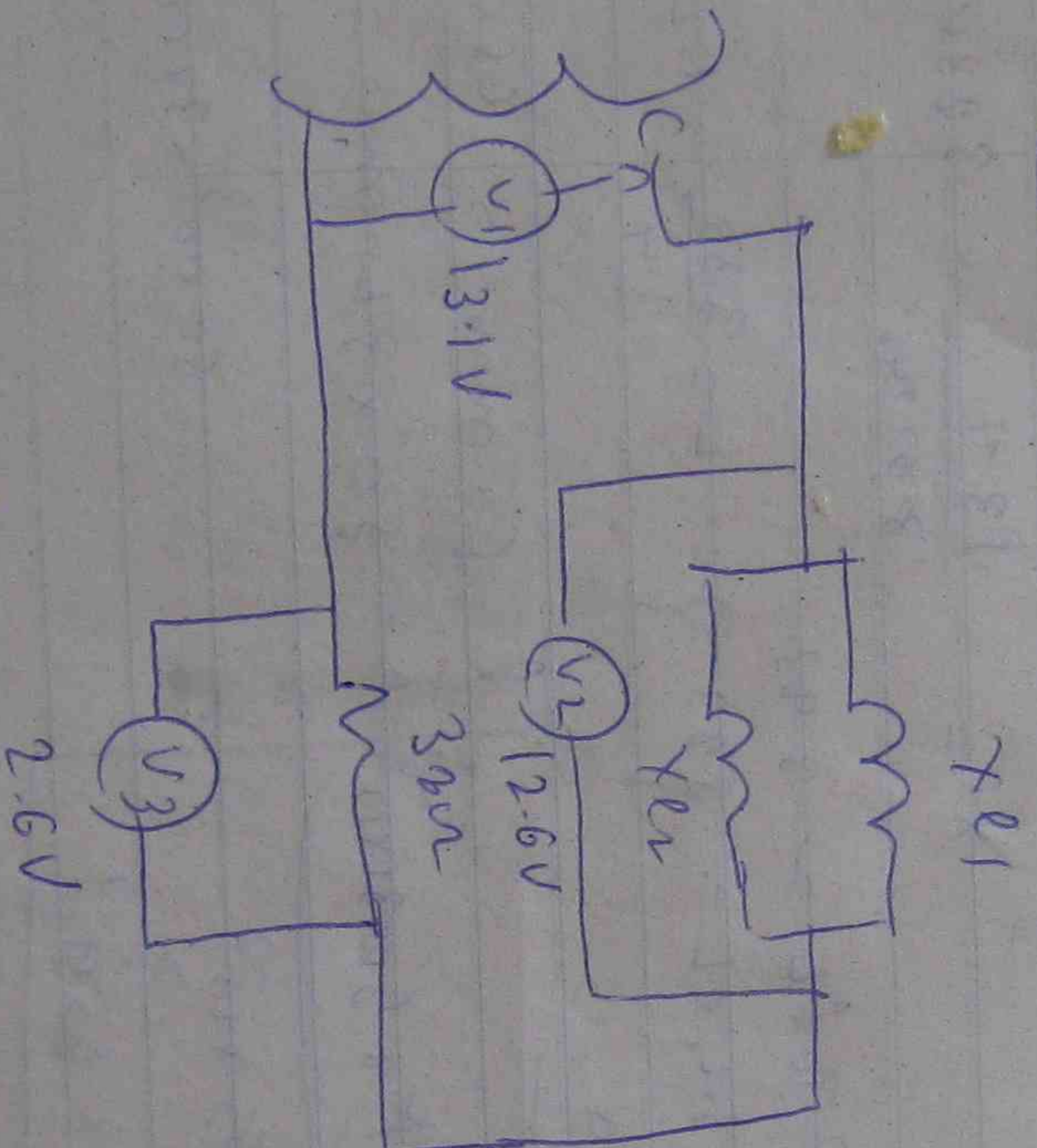
$$\frac{1}{X_{LT}} = \frac{1}{X_{L1}} + \frac{1}{X_{L2}} + \frac{1}{X_{L3}}$$

EXP 33



$$I = \frac{0.6}{39\Omega} = I$$

$$X_{L1} = \frac{V_1}{I}, \quad X_{L2} = \frac{V_2}{I}$$



$$I = \frac{2.6V}{39\Omega}$$

$$X_{L2} = \frac{V_1 - V_3}{\frac{2.6}{39}}$$