

(1)

(18)

(3 Hours)

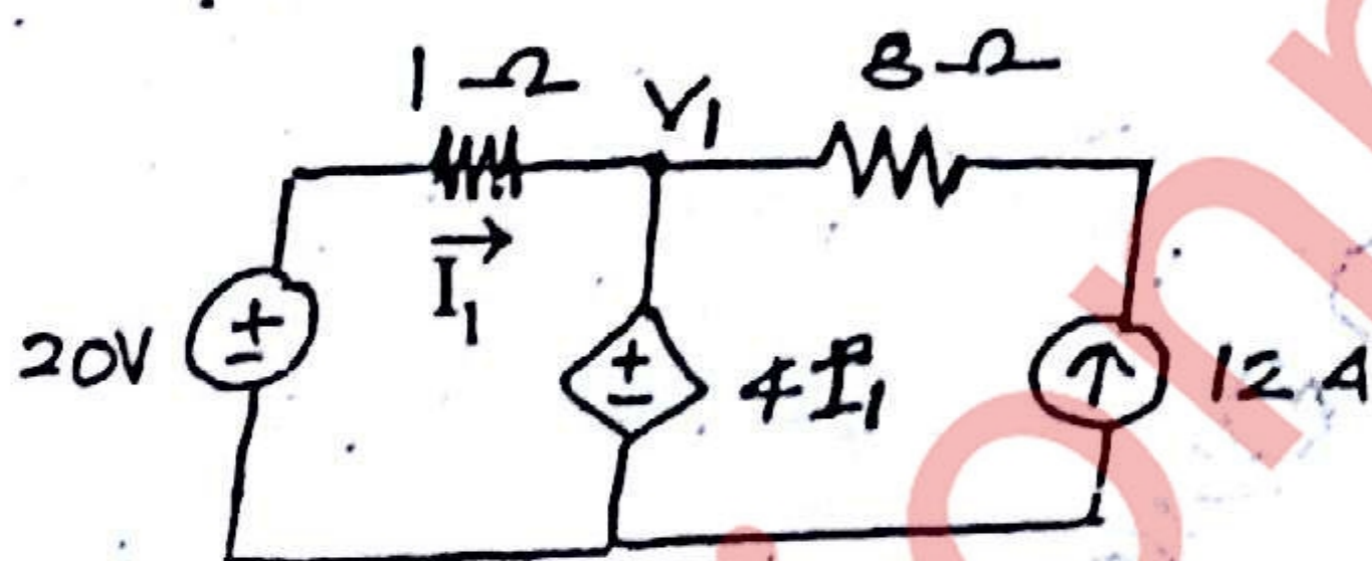
[Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.
 (2) Solve any three questions out of remaining.
 (3) Assume suitable data if required.
 (4) All questions carry equal marks.

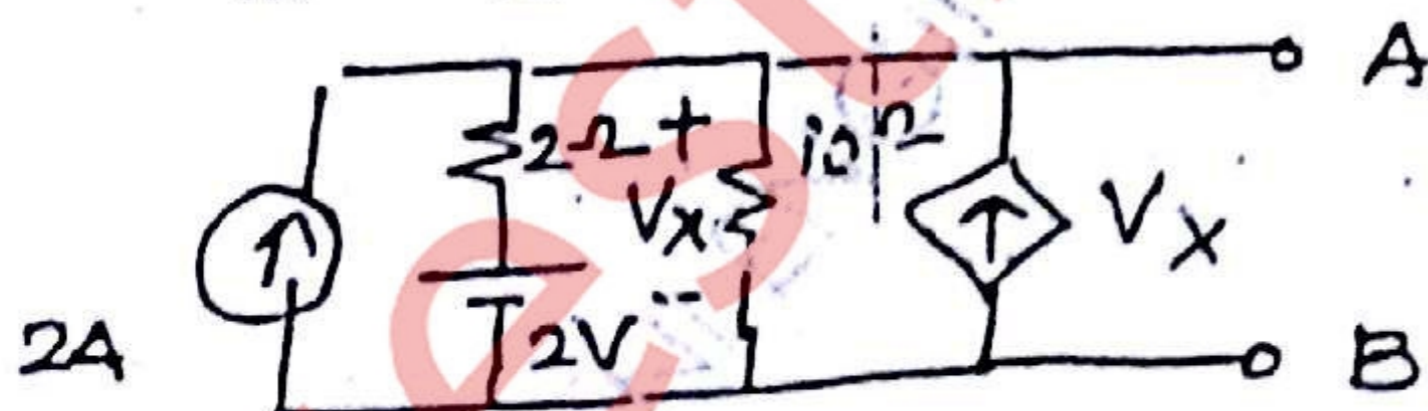
1. (a) Draw the graph from given incidence matrix and calculate total number of possible trees. 5

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & -1 & 0 & 0 & -1 \\ -1 & 0 & 1 & 0 & -1 & 0 \end{bmatrix}$$

- (b) Find v_1 by nodal analysis 5



- (c) Find V_{TH} & R_{TH} between points A & B in figure 5



- (d) Test whether the given polynomial is Hurwitz
 $(P(s) = s^4 + s^3 + 6s^2 + 4s + 24)$ 5

2. (a) Find condition of reciprocity and symmetry for open circuit impedance parameter. 10

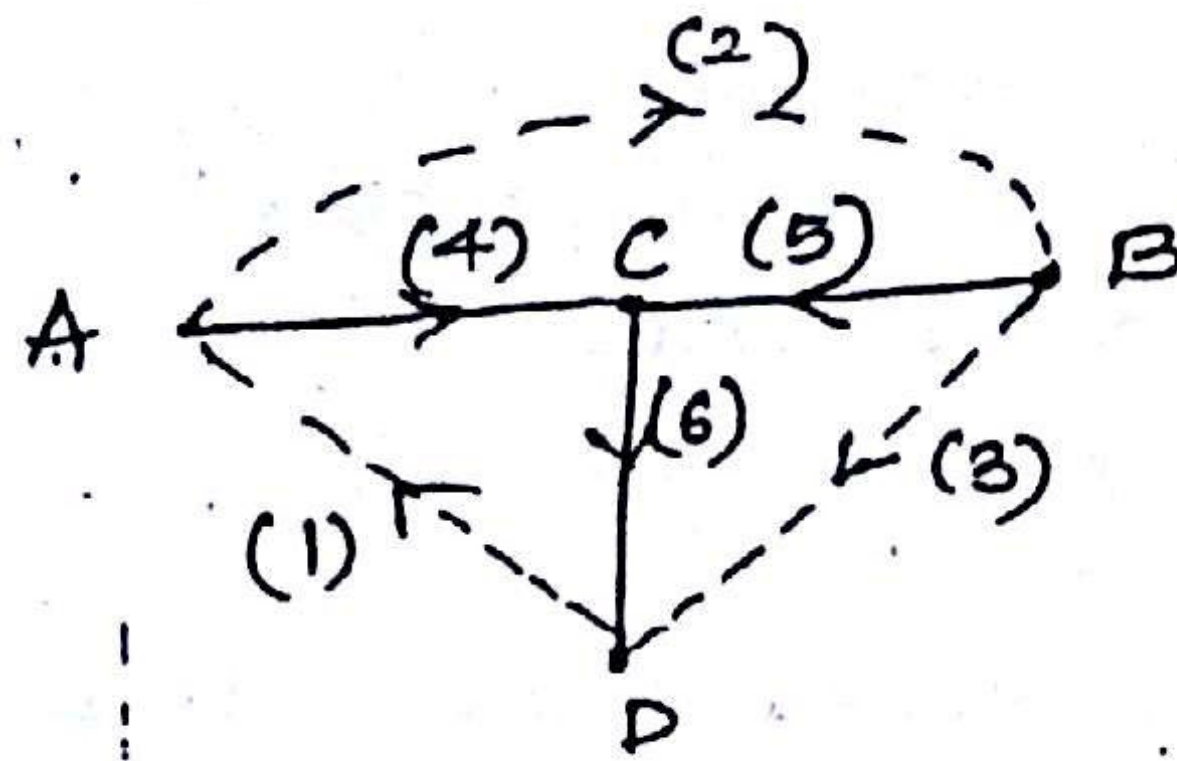
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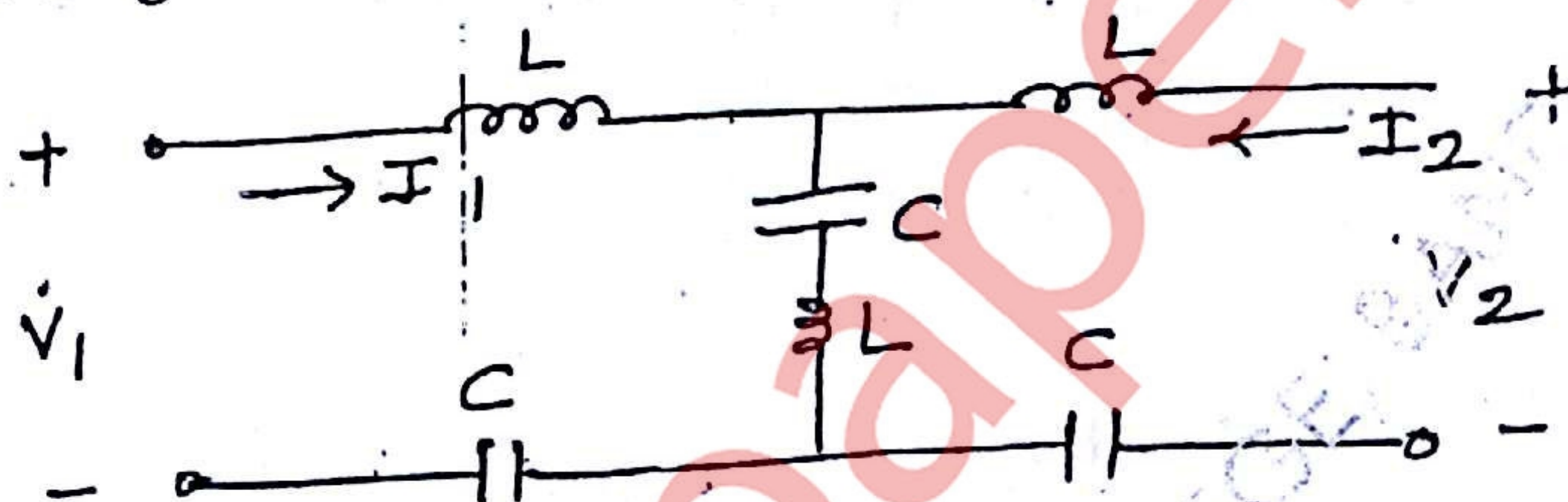
- (b) The oriented graph of a network is shown in figure. Write (i) incidence matrix (ii) f - cutet matrix (iii) f - tieset matrix.

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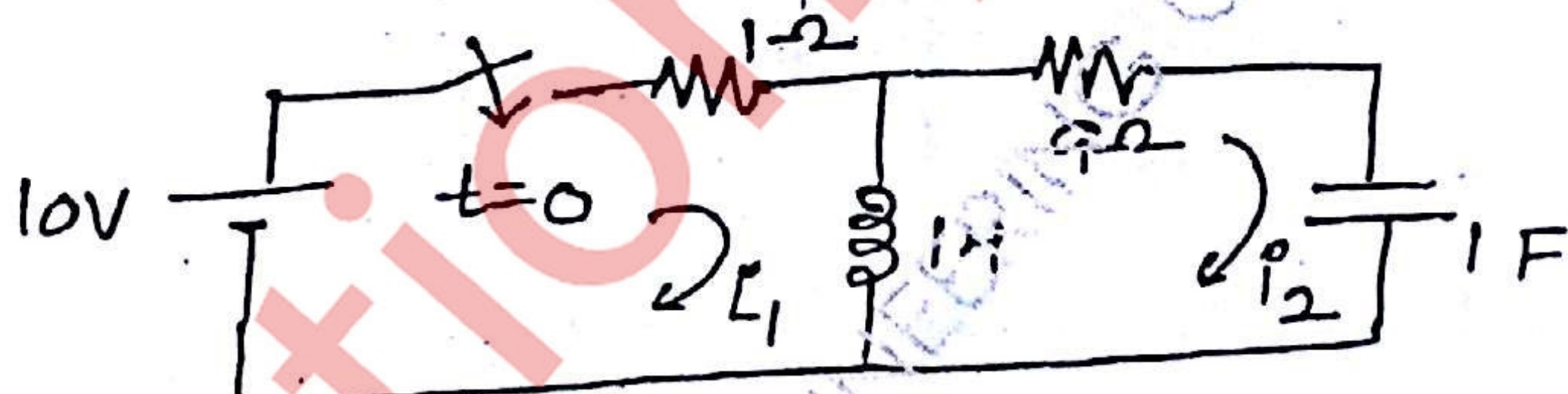
3. (a) For the given circuit find Z parameters and hence find Y parameters.

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- (b) Find $i_1(0^+)$, $i_2(0^+)$, $v_c(0^+)$, $\frac{di_1}{dt}(0^+)$ when the switch is closed at $t = 0$.

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4. (a) State and prove maximum power transfer theorem.
(b) Explain significance of initial conditions.

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5. (a) $Y(s) = \frac{(s+2)(s+5)}{s(s+4)(s+6)}$

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Synthesize using cauer - I and cauer II form

- (b) Test wheter following functions are P.R.F.

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(i) $Y(s) = \frac{s^3 + 5s}{s^4 + 2s^2 + 1}$

(ii) $F(s) = \frac{2s^3 + 2s^2 + 3s + 2}{s^2 + 1}$

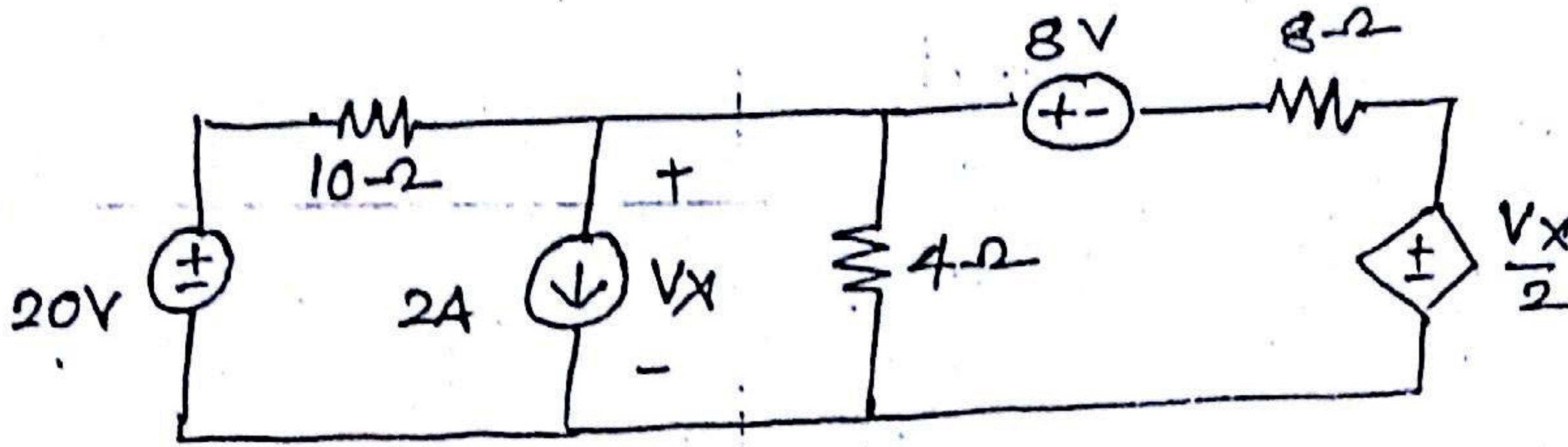
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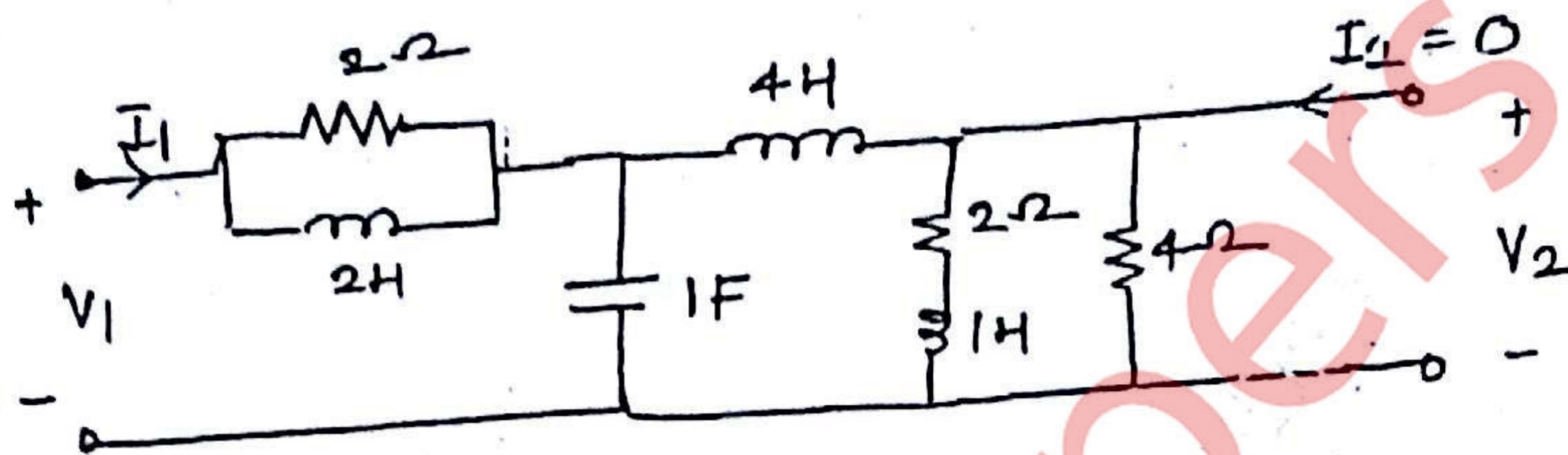
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6. (a) Using Mesh Analysis find V_x

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(b)



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Find $\frac{V_2}{V_1}$ and $\frac{I_2}{I_1}$