

10/6/2016

S.E - III Sem - Biomed Electrical Network Analysis & Synthesis

(11)

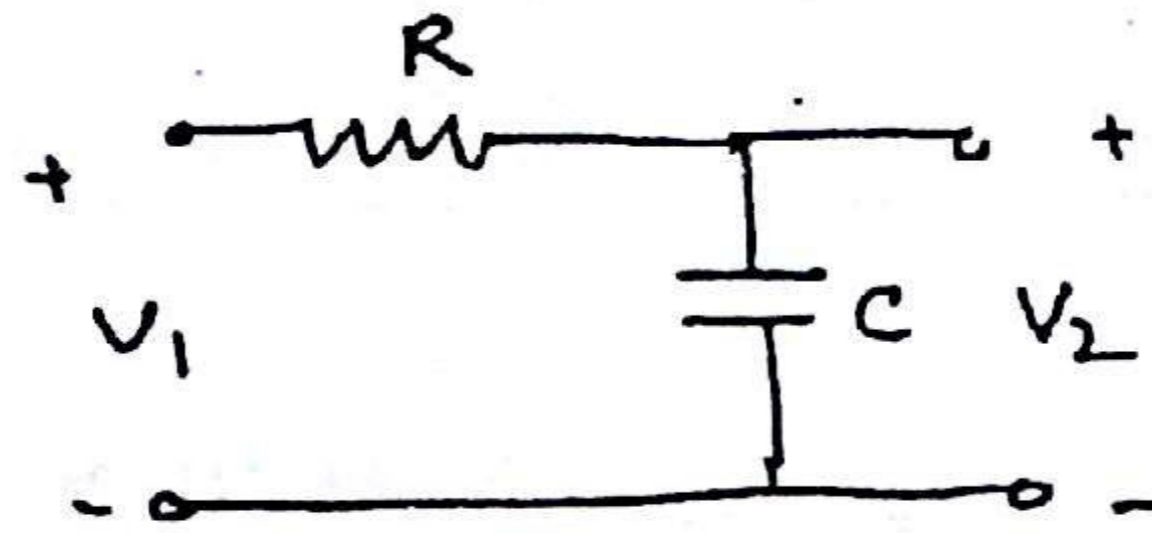
SE/III/CLD/BIM/ENAS
QP Code : 28856

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question No. 1 is compulsory
 (2) Solve any **Four** questions out of remaining
 (3) Figures to right indicate full marks

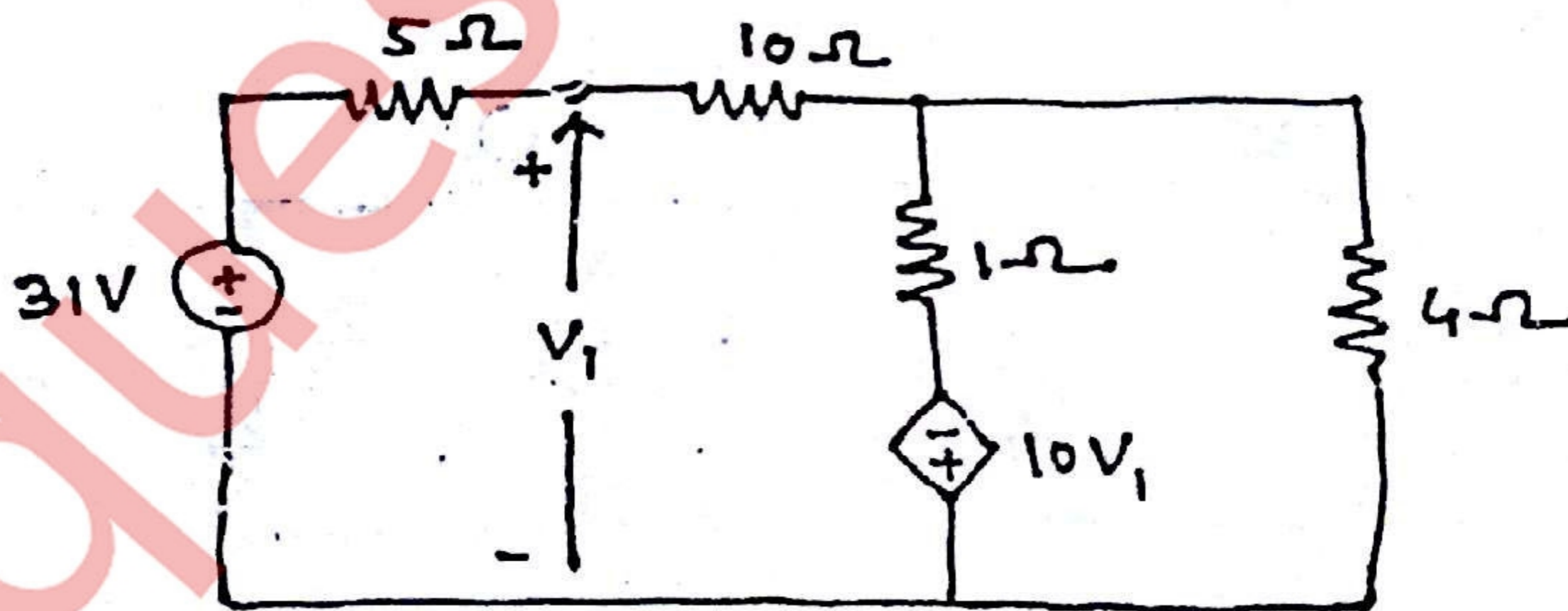
1. (a) For the two port network shown find voltage transfer function 5



- (b) Draw oriented graph for the given matrix. 5

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

- (c) Check the following polynomial for Hurwitz $3s^4 + 3s^3 + 5s^2 + 2s + 1$ 5
 (d) Obtain condition for summery and reciprocity in terms of Z-parameters 5
2. (a) Calculate current through 4Ω . 10



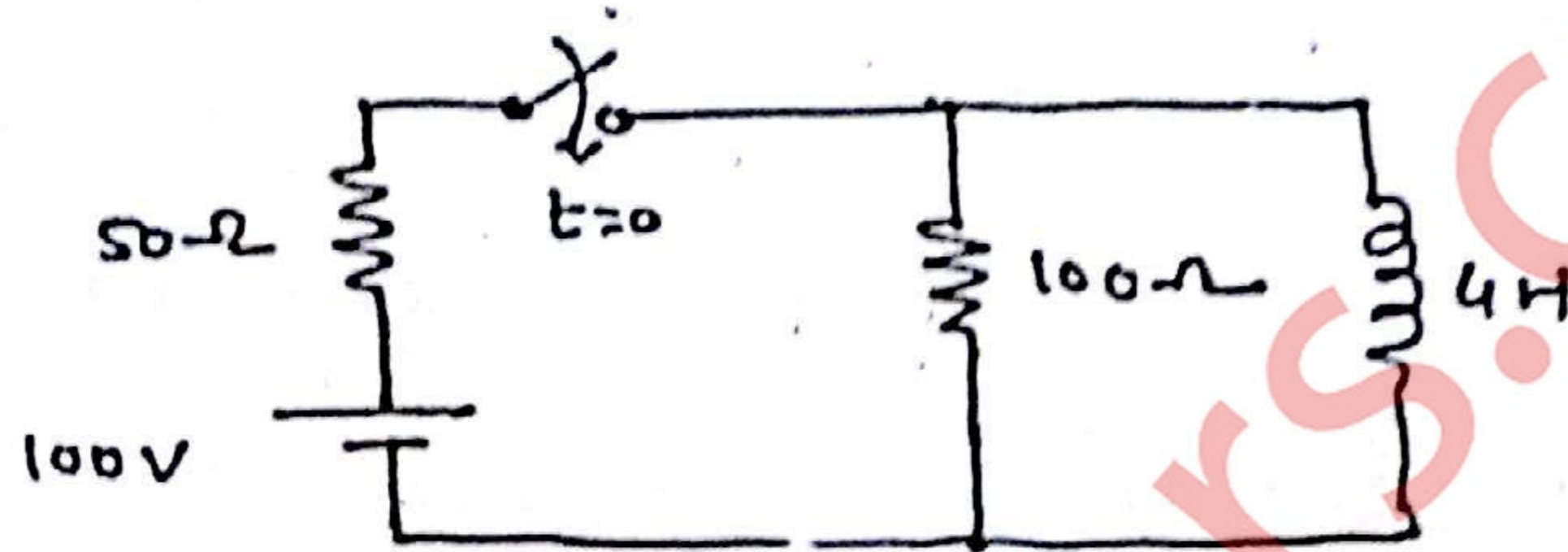
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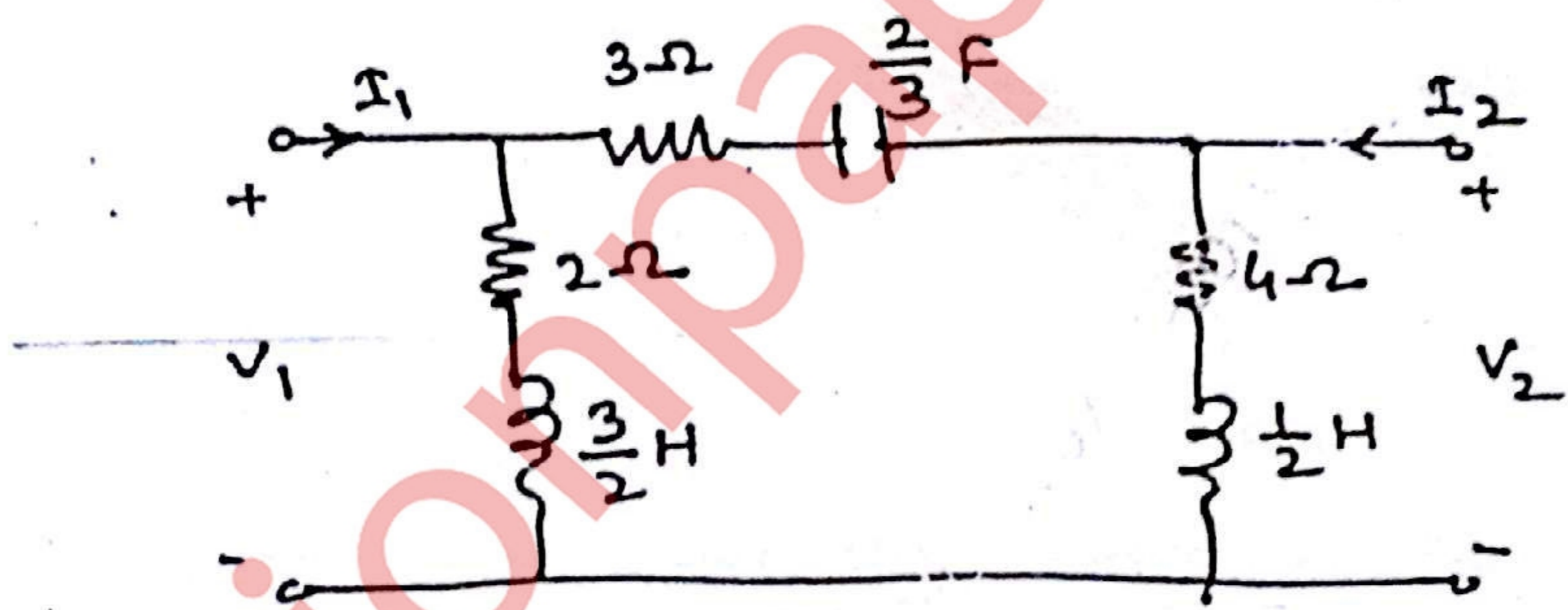
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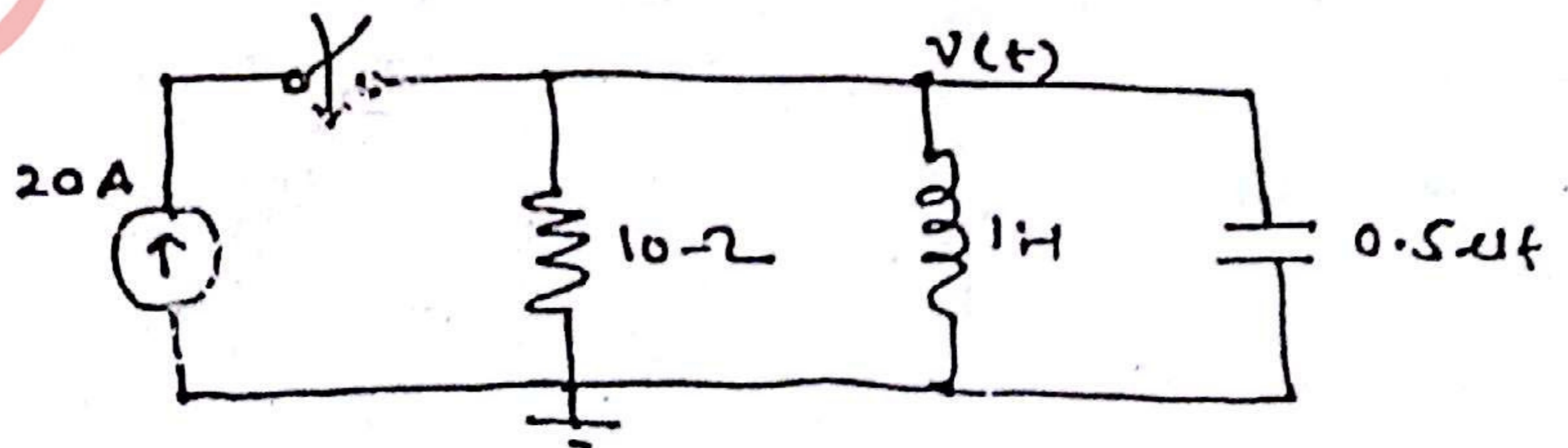
- (b) Find expression for current through inductor for $t > 0$ if switch is closed at $t = 0$



3. (a) Find y-parameters of two port n/w shown below



- (b) In the given network switch is closed at $t = 0$ solve for v , $\frac{dv}{dt}$, $\frac{d^2v}{dt^2}$ at $t = 0^+$



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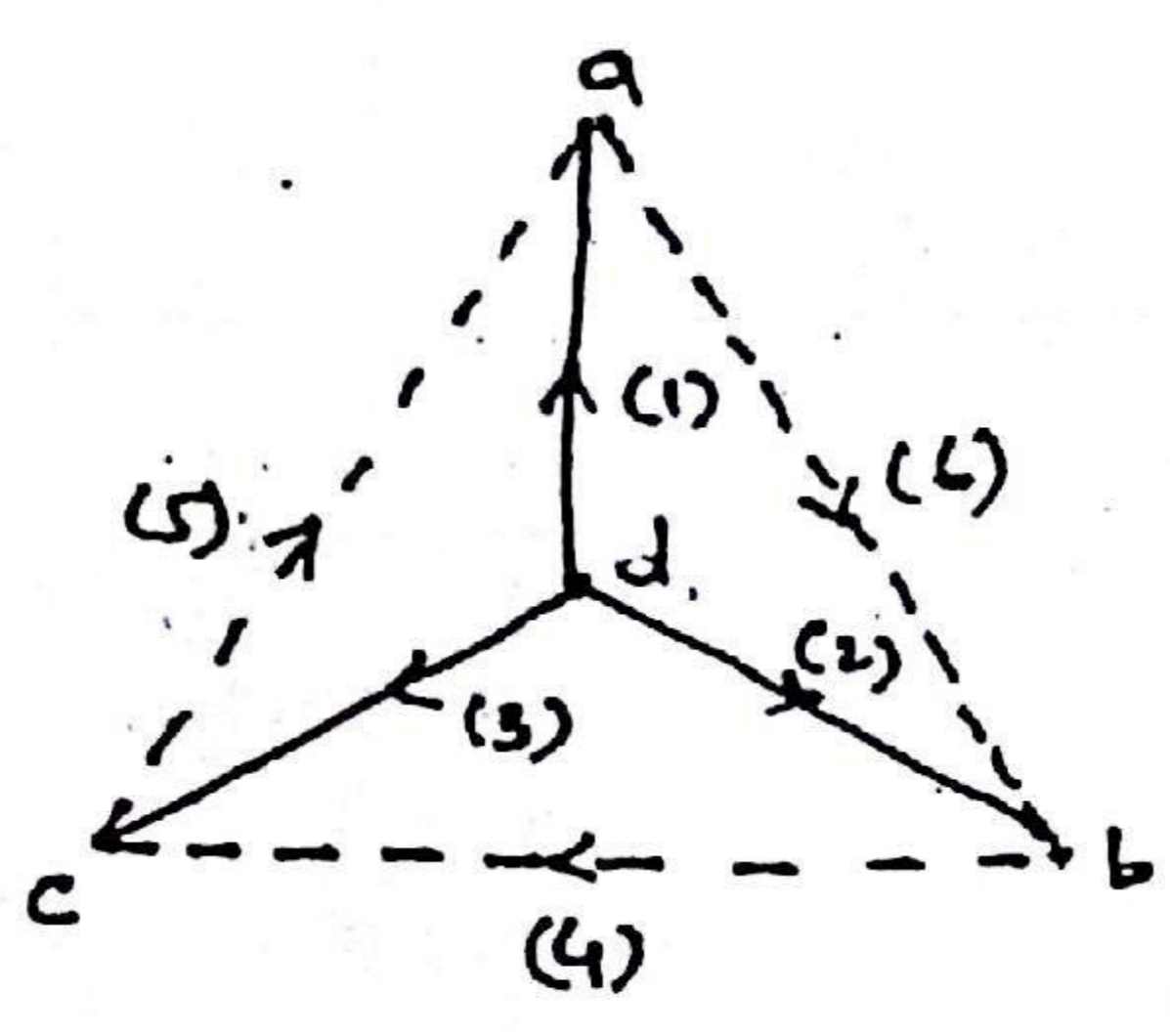
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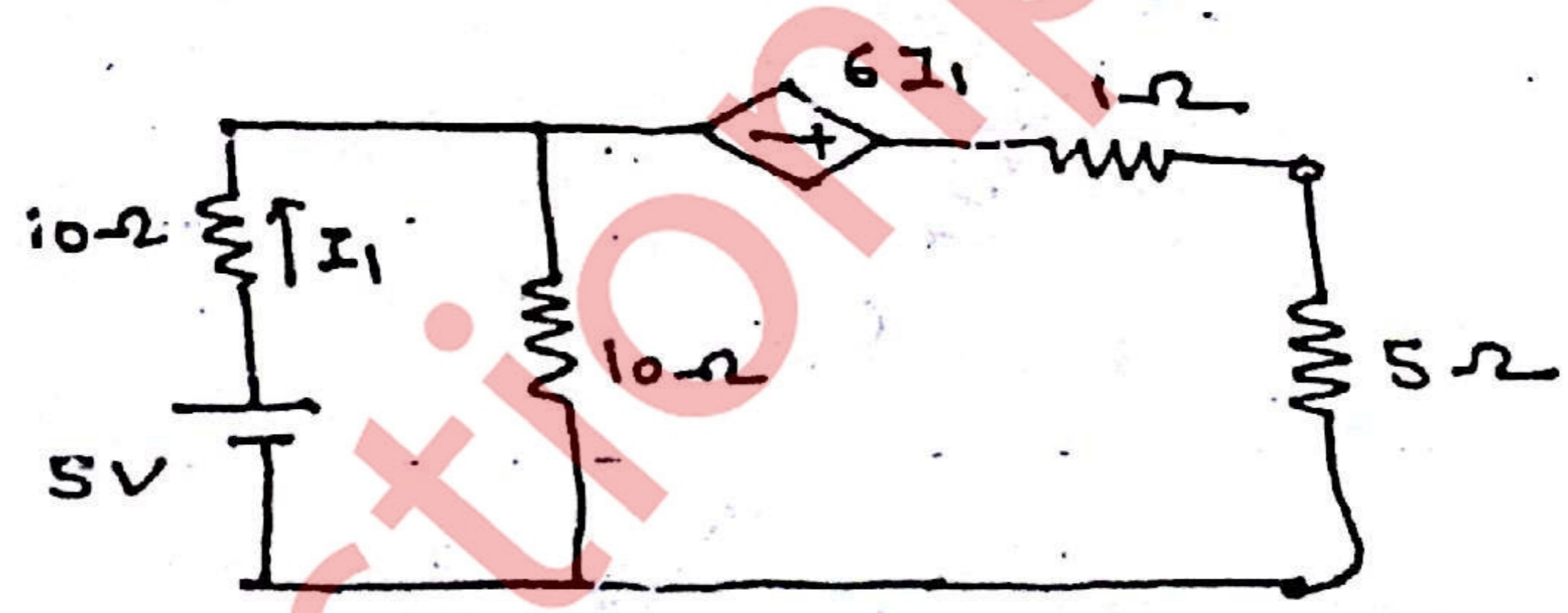
4. (a) For given graph obtain
- (i) Incidence matrix
 - (ii) f-cutest matrix
 - (iii) f-tie set matrix

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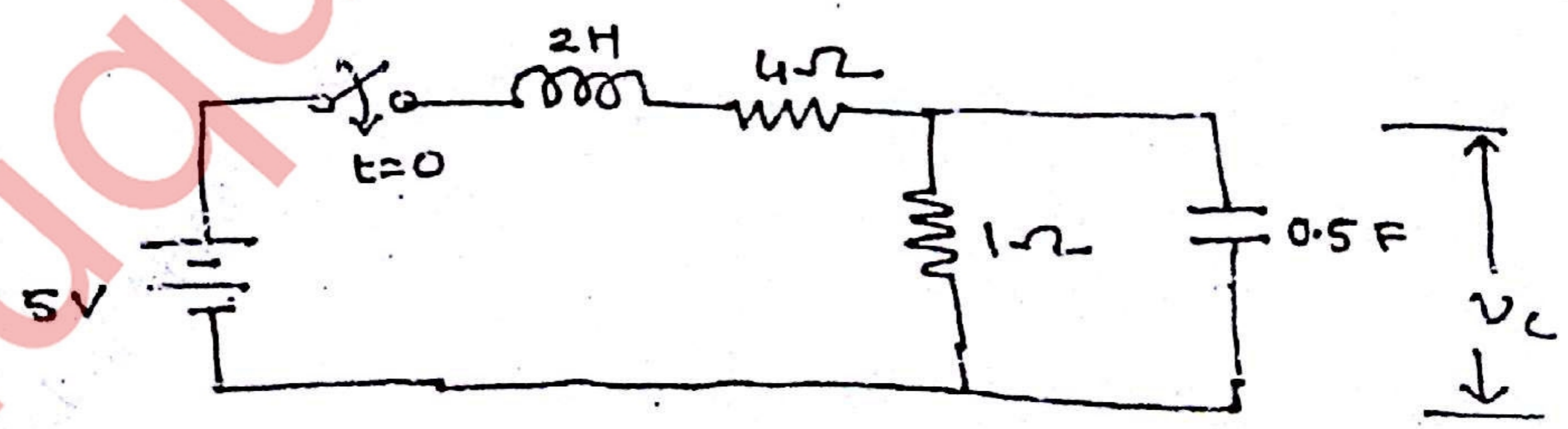
- (b) Find current through 5Ω by Theremin's theorem

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5. (a) In the network shown below switch is closed at $t = 0$. Find expression for v_c .

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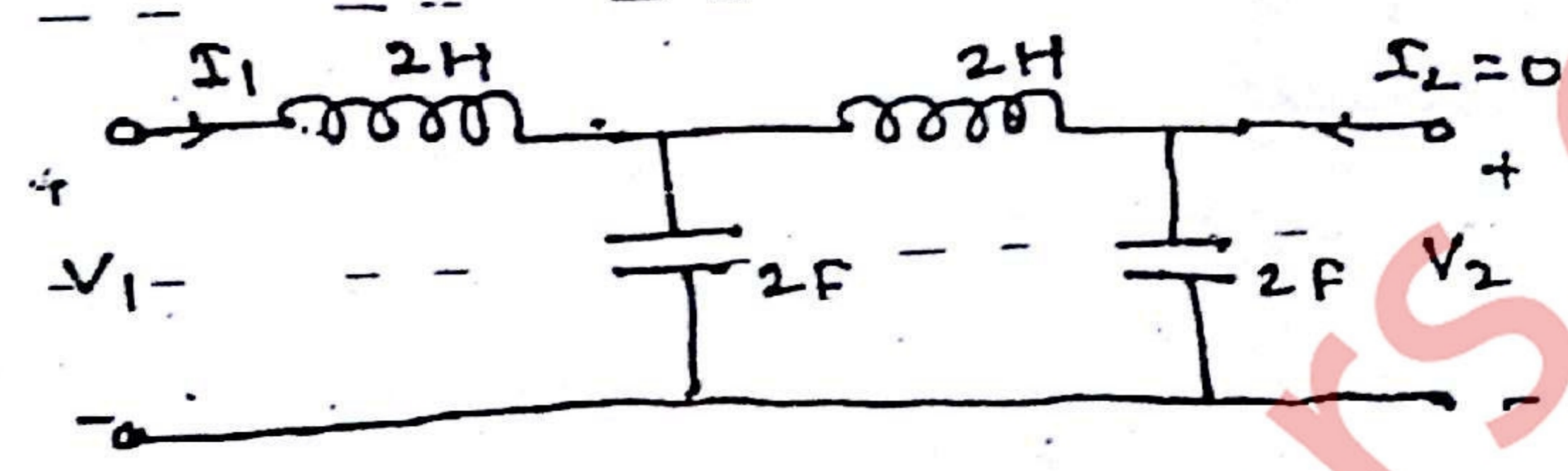


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(b) Find V_2/I_1 , V_2/V_1 , V_1/I_1 for the network shown

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6. (a) Test the following function for positive realness

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(i) $\frac{12s^2+5}{2s^3+s}$

(ii) $\frac{s^2+5s}{s^4+2s^2+1}$

(b) Write loop equations for following magnetic circuit and obtain equivalent circuit.

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7. (a) Realize foster and cauer form of the following impedance function

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$$Z(s) = \frac{4(s^2+1)(s^2+9)}{s(s^2+4)}$$

(b) Obtain dual of the following network

5

