

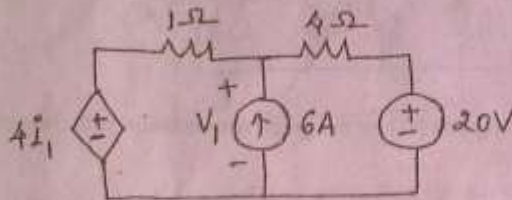
Sem - III Electrical Network Analysis & Synthesis ✓

- N. B. : (1) Question No. 1 is compulsory
 (2) Attempt any four questions from the remaining questions.
 (3) Assume data if required.

(8/10M)
 2/1/2/11

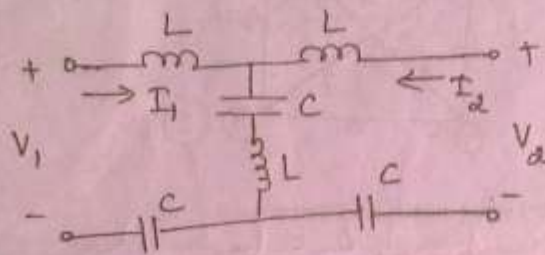
1. (a) Find V_1 by nodal analysis.

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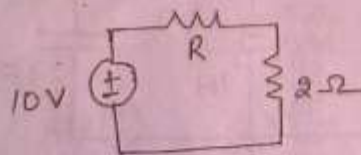
(b) Find the Z-parameters :-

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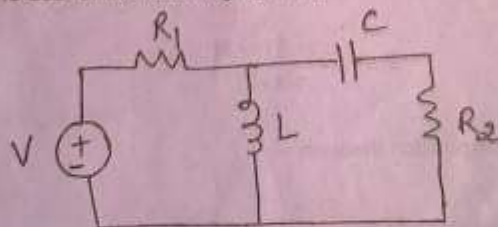
(c) Find the value of resistor R if the power dissipated in $2\ \Omega$ is 6 W.

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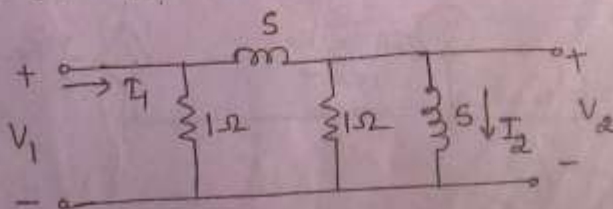
(d) Draw the dual of the following network.

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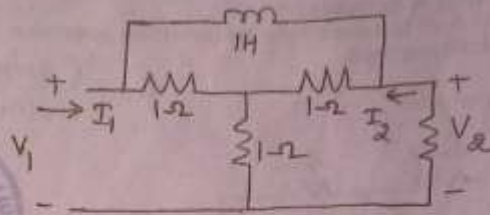
2. (a) Find V_2/V_1 and I_2/I_1 for the network shown :-

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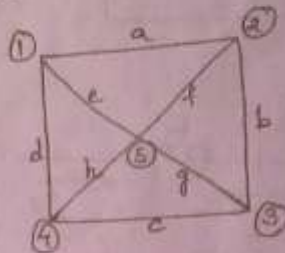


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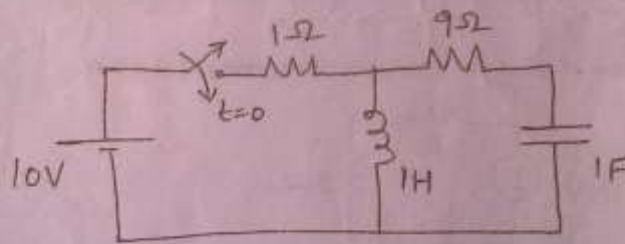
(b) Find the Z-parameters of the network shown :-



3 (a) Write the $[A_p]$, $[A]$, $[B_p]$ and $[Q_p]$ for the graph shown below with the nodes and branches labelled :-



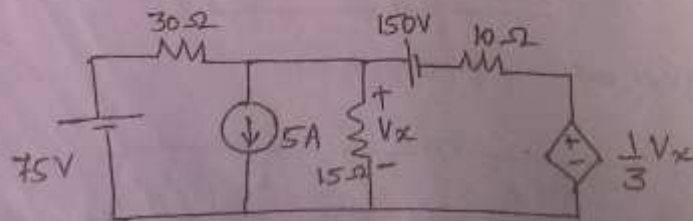
(b) Find $i_1(0^+)$, $i_2(0^+)$ when switch is closed at $t = 0$.



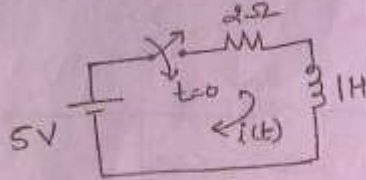
4. Realize the Foster and Cauer forms of the following impedance function i.e. Foster I and II, Cauer I and II.

$$Z(s) = \frac{(s+1)(s+3)}{s(s+2)}$$

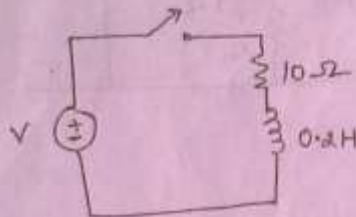
5. (a) Find V_x using superposition theorem -



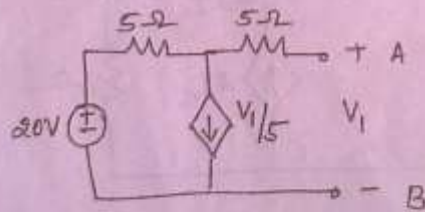
- (b) Find $i(0^+)$; $\frac{di}{dt}(0^+)$; $\frac{d^2i}{dt^2}(0^+)$, when the switch is closed at $t = 0$ in the following circuit :-



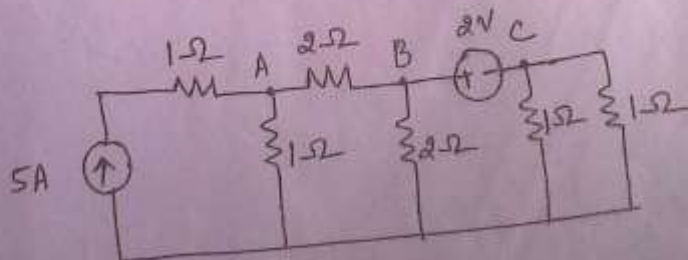
6. (a) The series RL circuit has $V = 50 e^{-100t}$. Find the current for $t > 0$, when switch is closed at $t = 0$.



- (b) Find the Thevenin's equivalent circuit -



- (c) Find V_A , V_B and V_C

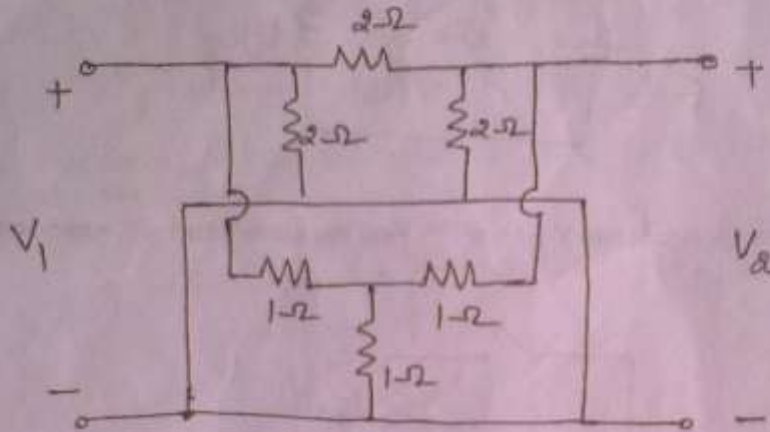


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7. (a) Check for positive realness :-

$$F(s) = \frac{s^2 + 1}{s^3 + 4s}$$

(b) Find the Y-parameters :-



(c) Find I_a and V_A .

