

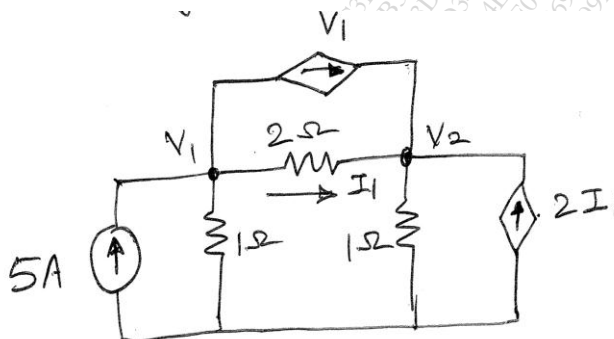
[Time: 3 Hours]

[ Marks:80]

Please check whether you have got the right question paper.

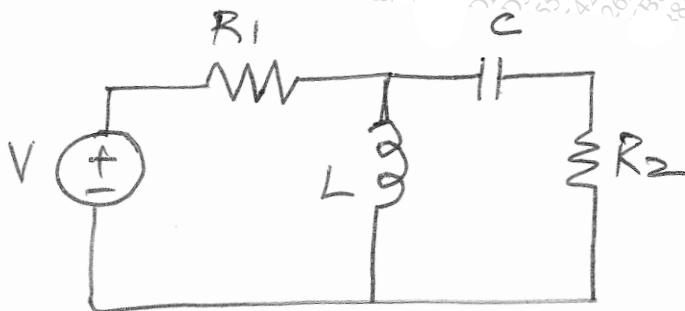
- N.B:
1. Question No. 1 is compulsory.
  2. Attempt any three questions out of the remaining five.
  3. Assume suitable data if required.
  4. Figures to the right indicate full marks.

Q.1 a) Find voltages  $V_1$  and  $V_2$



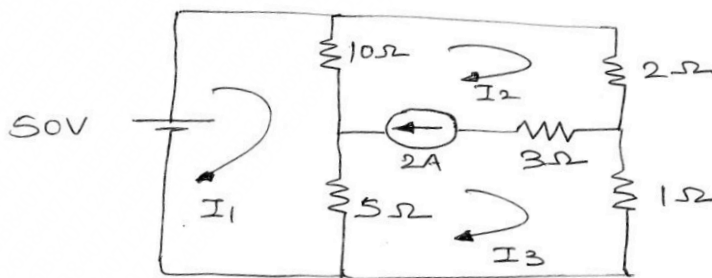
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b) Draw the dual of the following network.



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c) Find the current in the  $5\Omega$  resistor.



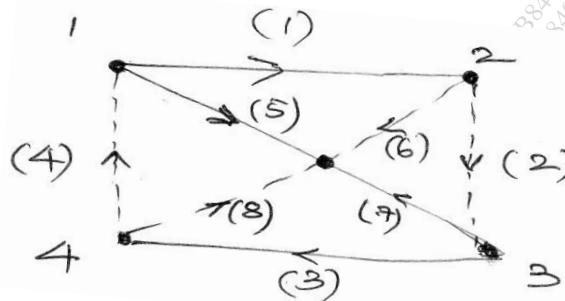
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d) Write a short note on Initial conditions and its significance

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Q.2 a) For the graph shown, write the incidence matrix, tieset matrix and f-cutset matrix.

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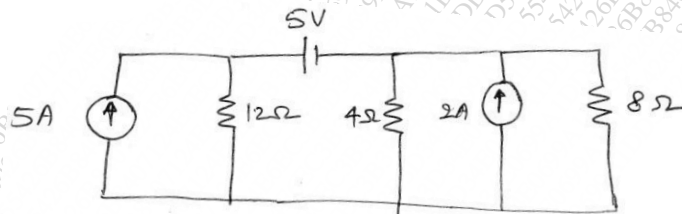
b) Define with suitable examples the following:-

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- i) Planar graph.
- ii) Non-planar graph.
- iii) Tree
- iv) Co-tree.

Q.3 a) Find the current through the 8Ω resistor, using Norton's Theorem.

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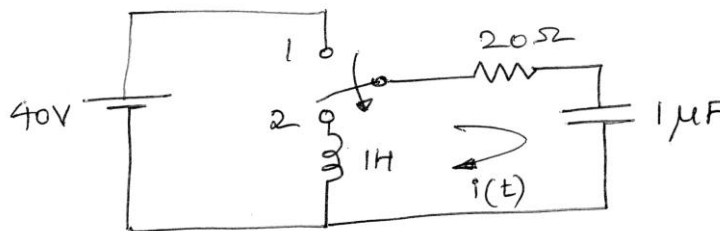


b) Derive the maximum power theorem and derive the expression for  $P_{max}$ .

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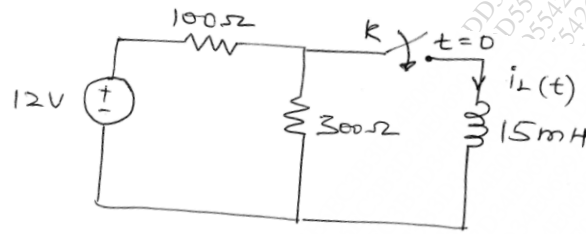
c) In the network shown in figure, the switch is changed from position 1 to position 2 at  $t=0$ , steady condition having reached before switching. Find the values of  $i$ ,  $\frac{di}{dt}$  and  $\frac{d^2i}{dt^2}$  at  $t=0^+$

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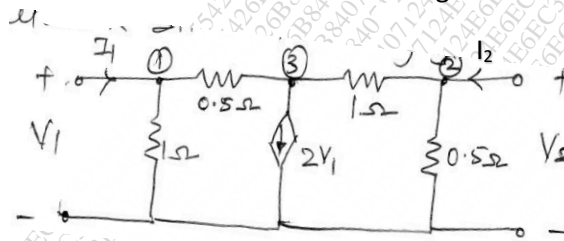
Q.4 a) In a network shown the switch is closed at  $t=0$ . Determine  $i_2(t)$

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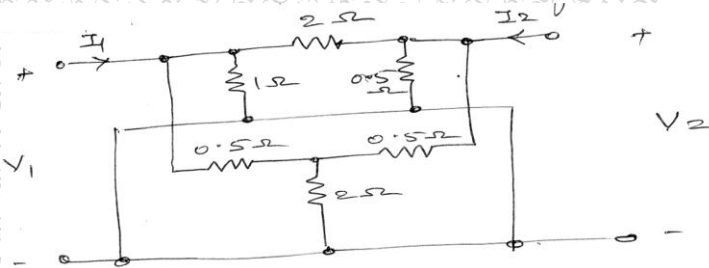
Q.4 b) Determine the Y and Z parameters for the network shown in the fig.

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Q.5 a) Find the Y parameters of the network shown.

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b) Define transmission parameters and find their condition of reciprocity and symmetry.

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Q.6 a) Realize the foster forms of the following function:-

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

b) Check whether following polynomials are rewrite or not:-

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i)  $P(s) = 2S^6 + S^5 + 13S^4 + 6S^3 + 56S^2 + 25S + 25$

ii)  $P(s) = S^8 + 5S^6 + 2S^4 + 3S^2 + 1$

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