

A-403-40  
A-404-38  
A-406-13

103

S.E. Electrical III CBGS  
EN

16.12.15  
QP Code : 5247

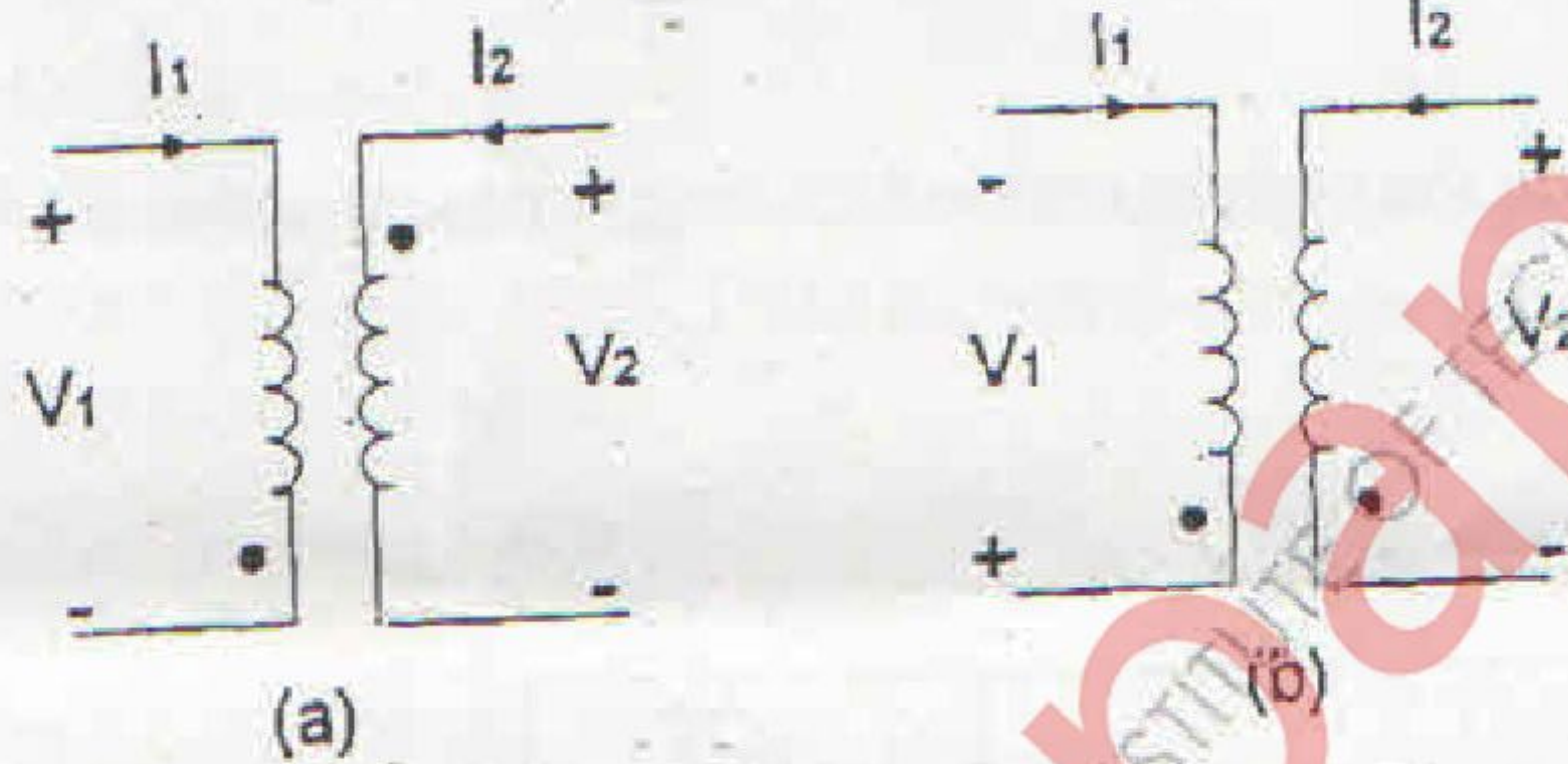
(3 Hours)

[ Total Marks : 80

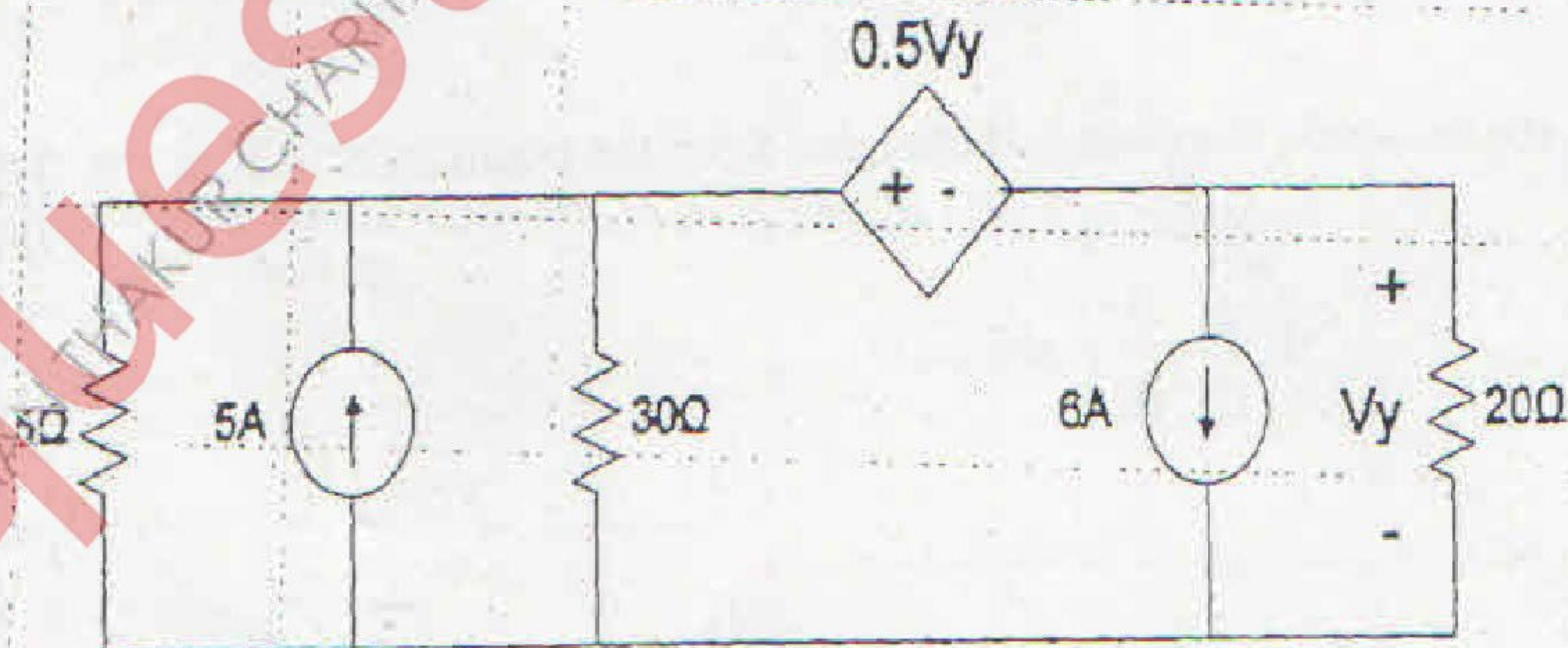
- N.B. : (1) Question no 1 is compulsory  
(2) Solve any three questions from remaining five questions.  
(3) Right figure indicate marks.  
(4) Figures to the right indicate full marks.

1. Attempt the following

- (a) Derive the frequency domain equivalent for inductor with initial current  $I_0$  and capacitor with initial voltage  $V_0$   
(b) Write the equations for  $V_1$  and  $V_2$  for circuits shown in figure (a) and (b)



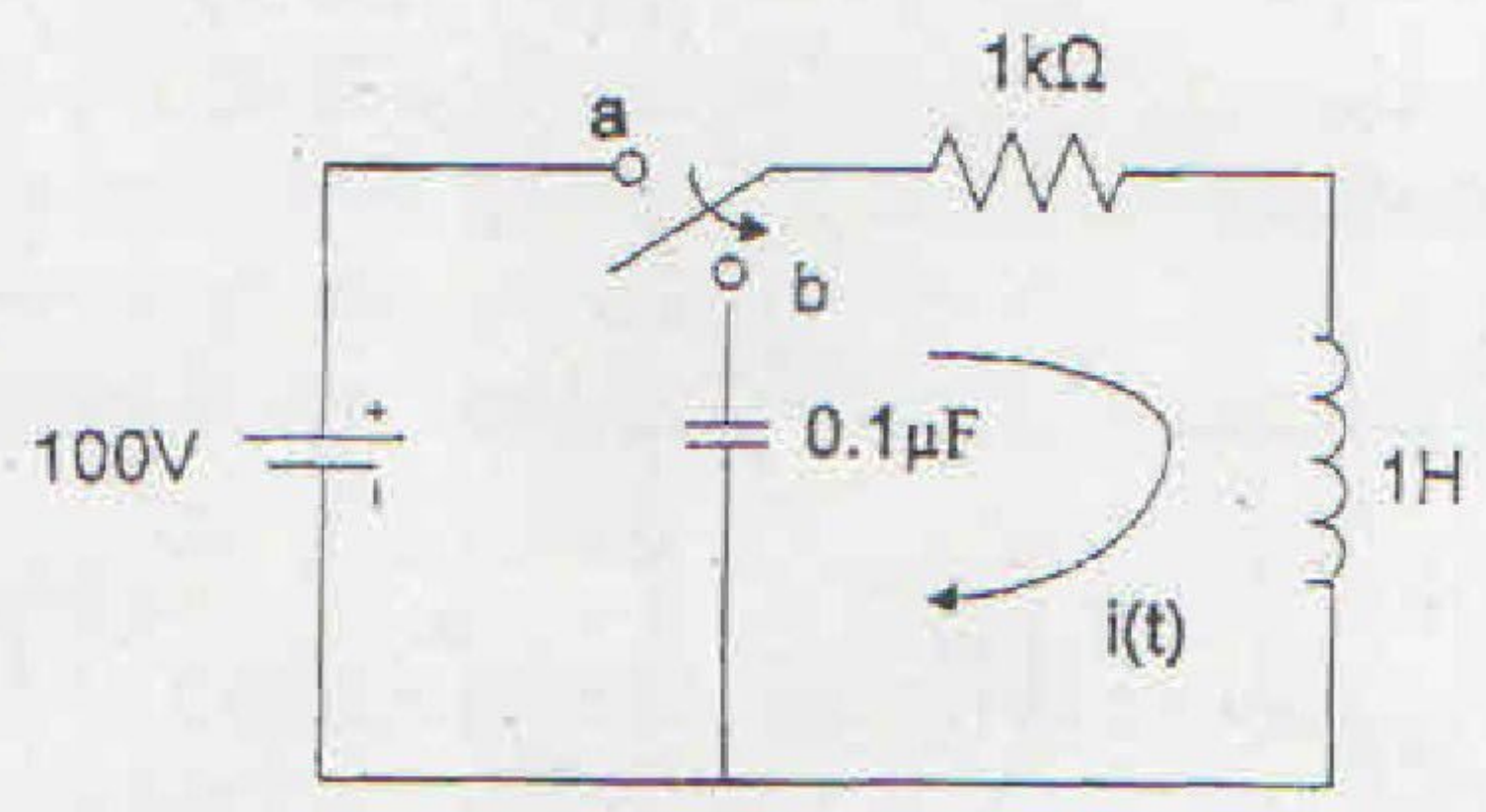
- (c) What are restrictions on pole and zero location for driving point function.  
(d) Write the properties of positive real function.
2. (a) Use nodal analysis to find  $V_y$  in the given circuit.



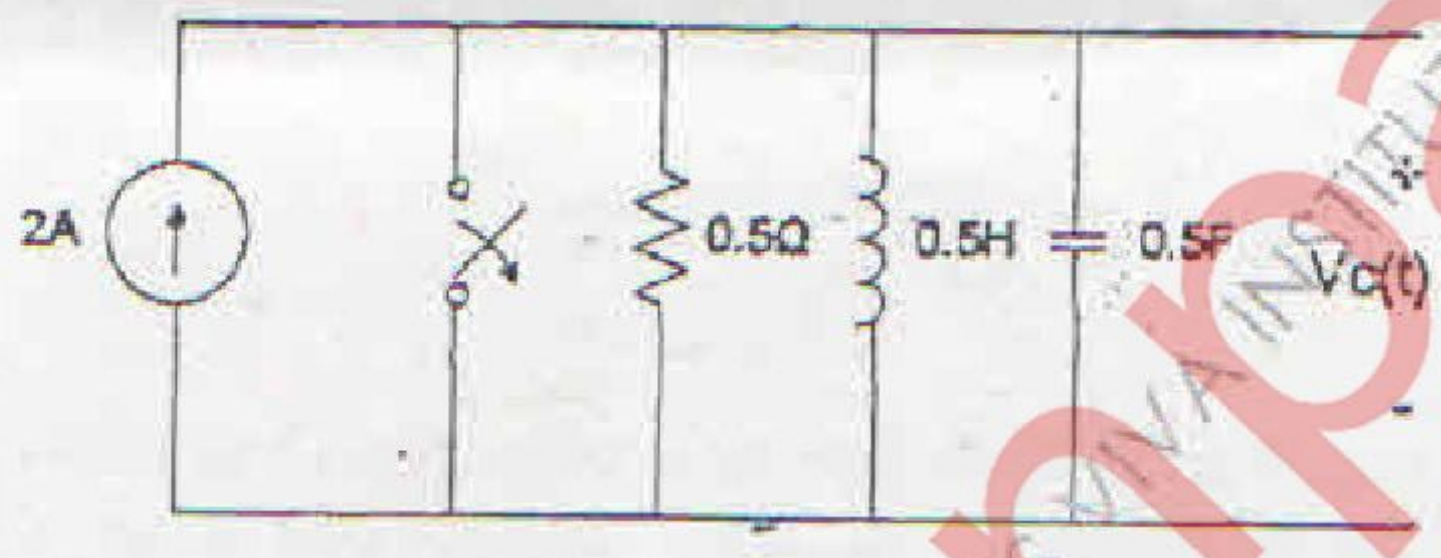
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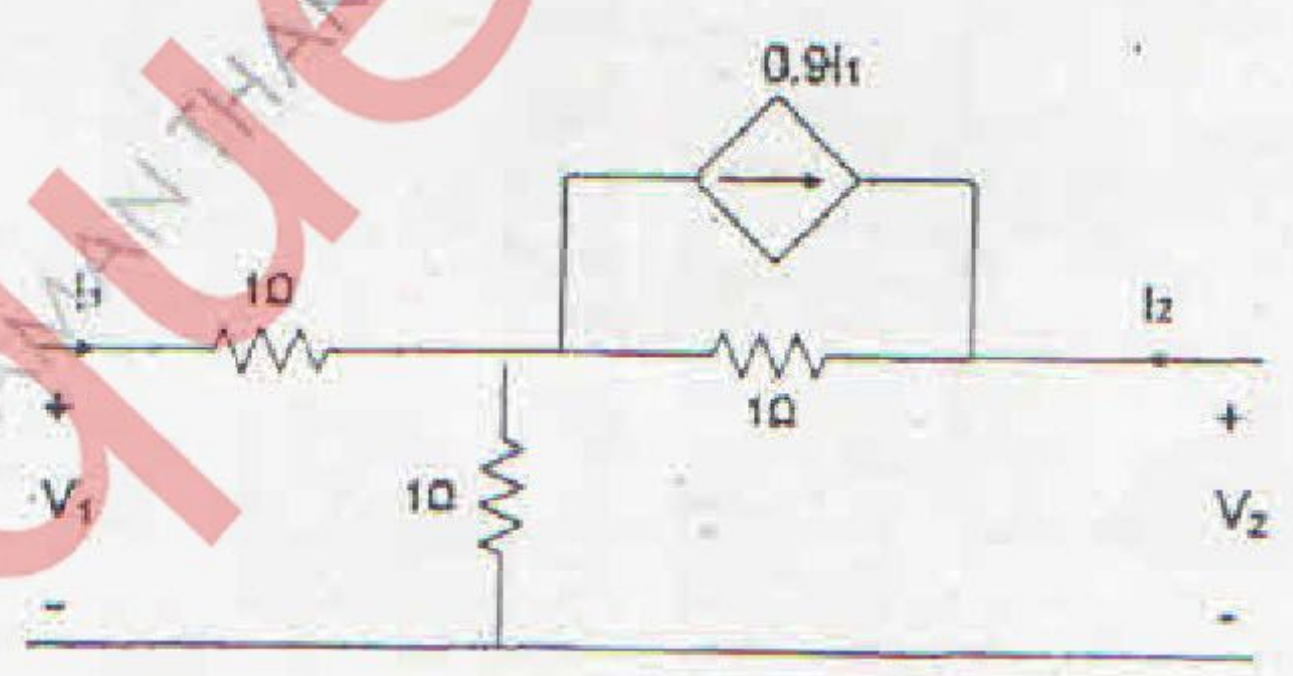
- (c) Derive the response on unit step signal in case of series RL circuit. 4
4. (a) Explain duality in a network 5  
 (b) Find the condition of reciprocity in case of short circuit parameters. 5  
 (c) The switch is opened at time  $t=0$ . Determine the voltage  $v(t)$  for  $t > 0$  using Laplace transform in the given network. 10



5. (a) Synthesize the following function by Cauer I and Cauer II form 10

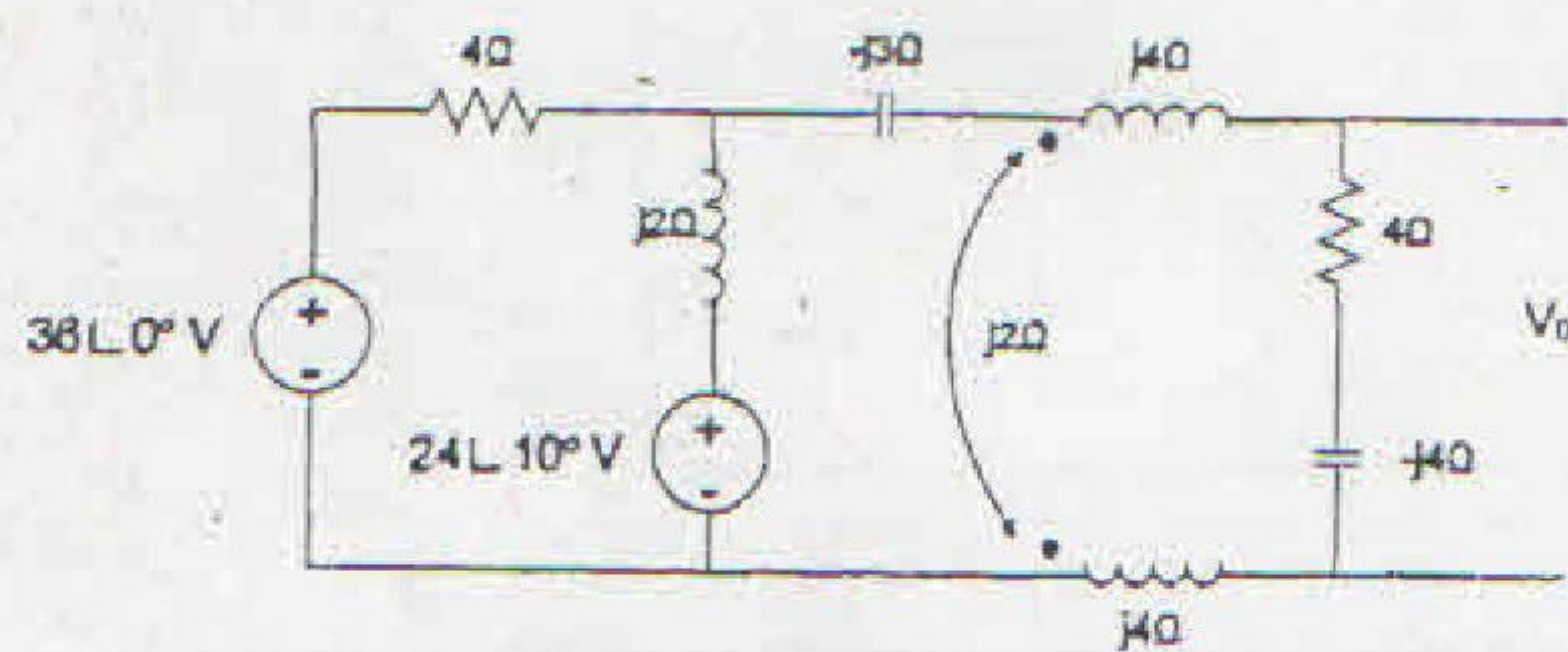
$$z(s) = \frac{(s+2)(s+5)}{(s+1)(s+3)}$$

- (b) Find the Z parameters for the network shown. Hence find h parameters. 10





6. (a) The current  $I(s)$  in a network is given by  $I(s) = \frac{2s}{(s+1)(s+2)}$  Plot the pole zero pattern in  $s$  plane and obtain  $i(t)$  8  
 (b) Find  $V_o$  in the network shown 10



- (c) Write the equilibrium equation on KCL and KVL basis for network 2

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