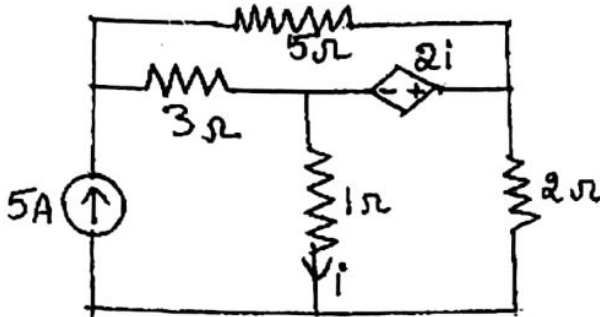
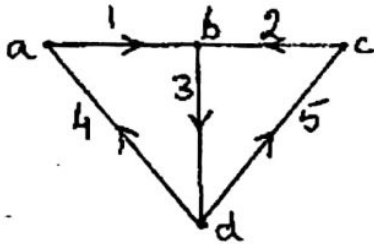


- N.B: 1. Question No. 1 is compulsory.
 2. Attempt any three from the remaining questions.

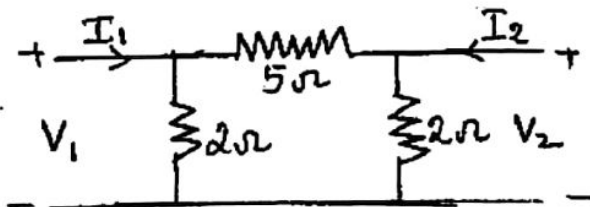
1. (a) Find the voltage drop across 5Ω resistor in the circuit given below. 5



- (b) For the graph given below obtain the incidence matrix and find the number of possible trees. 5



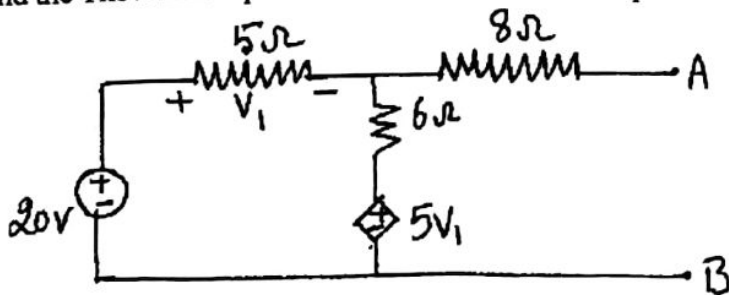
- (c) Find y parameters for the two-port network shown in figure. 5



- (d) Check whether the following polynomials are Hurwitz 5

- (i) $P(s) = s^4 + 7s^3 + 6s^2 + 21s + 8$
 (ii) $P(s) = s^5 + 2s^3 + s$

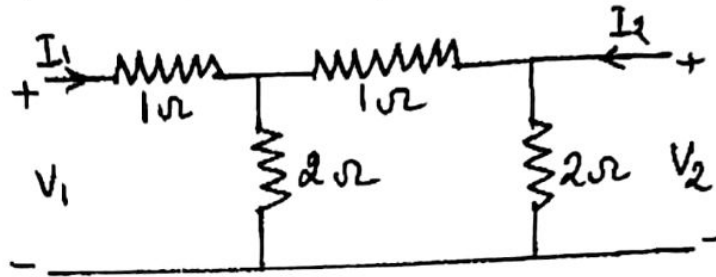
2. (a) Find the Thevenin's equivalent across AB and find the power dissipated in a 25Ω load. 10



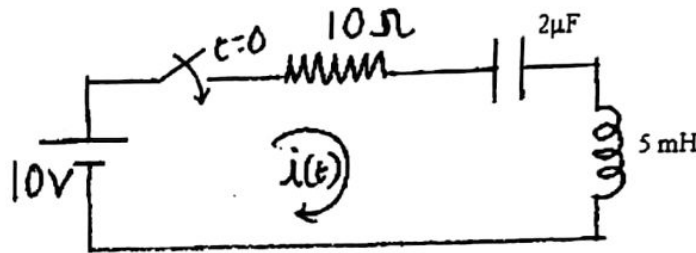
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7D4AB4BCBF238DAD14A13254DE7E6881

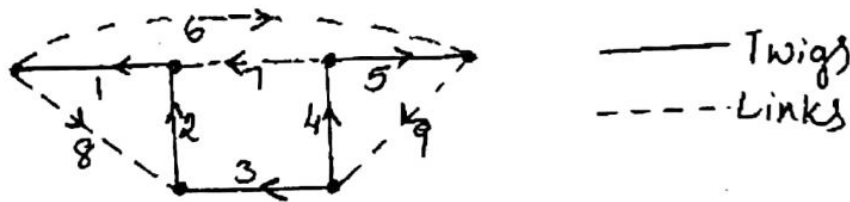
(b) Find h parameters for the following Two-port network. 5



(c) In the network shown below the switch is closed at $t = 0$. Assuming all initial conditions to be zero, find i , di/dt , d^2i/dt^2 for $t = 0^+$. 5



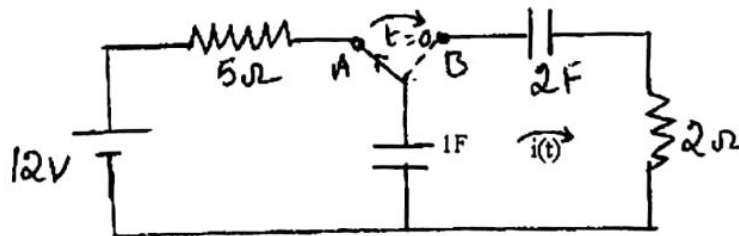
3. (a) Find the tie-set and f-cutset matrix for the oriented graph shown below. 10



(b) Realize the following function in Foster I and Foster - II forms. 10

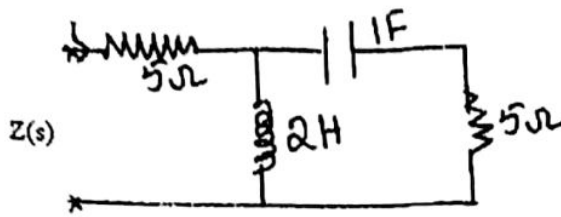
$$Z(s) = \frac{(s+1)(s+4)}{s(s+2)}$$

4. (a) A switch is in position A for a long time and then thrown to position B at $t = 0$. Find $i(t)$ for $t > 0$. At what value of 't' the current $i(t)$ will become half of current at $t = 0$ 10



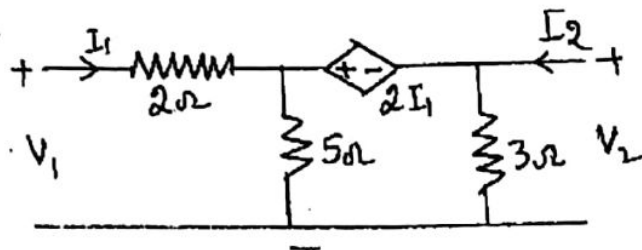
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- b) For the following network find the driving point impedance function. 5



- (c) Find the condition for symmetry and reciprocity for a two port network using any one parameter. 5

- (a) Obtain the ABCD parameters of the following network. If two such networks are cascaded find the overall ABCD parameter. 10



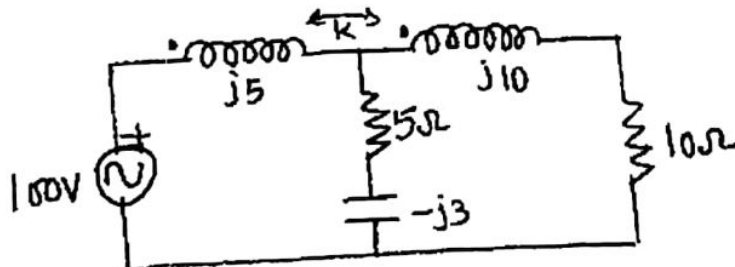
- (b) Check whether the following function is positive real or not. 5

$$F(s) = \frac{(s^2 + 6s + 5)}{(s^2 + 9s + 14)}$$

- (c) Find the oriented graph if the incidence matrix of the network is as given below. 5

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

- (a) Find the mesh currents if the coupling factor $k = 0.6$ 10



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(b) Find $i_2(t)$ using Laplace transform.

10

