

[Time: 3 Hours]

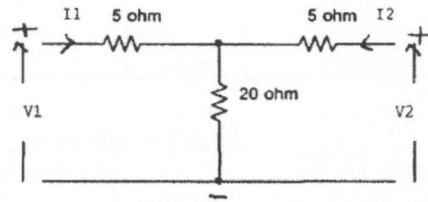
[ Marks:80]

Please check whether you have got the right question paper.

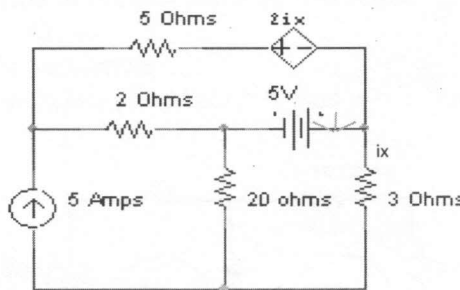
- N.B:
1. Question one is compulsory.
  2. Answer any three questions from the remaining five.
  3. Assume suitable data if required.



1. a) Find y parameters. 05

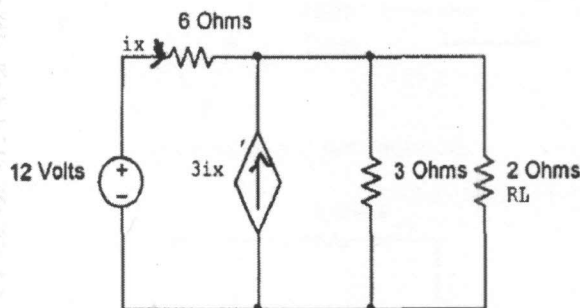


- b) Find the current through 5Ω resistor 05



- c) What is a Positive Real function? What are the properties of PR function? 05  
 d) Realize the following function in Cauer-I and Cauer-II forms 05  
 $Z(s) = S(S+3) / (S+1)$

2. a) Find the current through RL, in the circuit given below using Norton's theorem and also find power dissipated in RL. 08



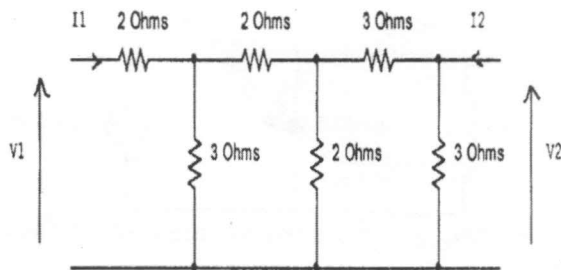
- b) Check whether the following functions are Hurwitz 06

- i)  $P(s) = S^4 + 6S^3 + 10S^2 + 18S + 36$
- ii)  $P(s) = S^6 + 2S^5 + 5S^4 + 8S^3 + 8S^2 + 8S + 1$

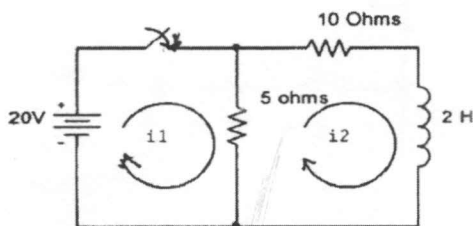
- c) Draw the graph of the network whose incidence matrix is given below. 06

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

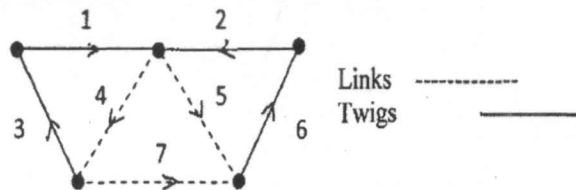
3. a) Find the overall ABCD parameters of the following network, by dividing the network into two or more sections. 10



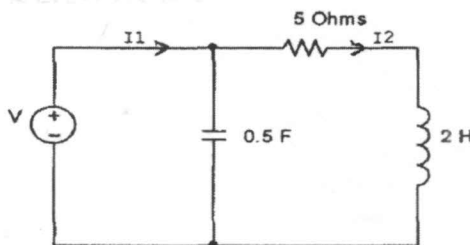
- b) State and prove final value theorem. 05  
 c) Test whether the following function is Positive Real 05  
 $F(S) = (2S^2 + 2S + 1) / (S^3 + 2S^2 + S + 2)$
4. a) Synthesize the following function in Foster-I and Foster-II forms 08  
 $Z(S) = 4(S + 2)(S + 7) / S(S + 4)$   
 b) Find h parameters in terms of z parameters 06  
 c) In the following network the switch is closed at  $t = 0$ , find  $i_1(0^+)$ ,  $di_1(0^+) / dt$ ,  $d^2i_1(0^+) / dt^2$ ,  $i_2(0^+)$ ,  $di_2(0^+) / dt$  06



5. a) Obtain the tieset and f-cutset matrix for the graph given below. 10

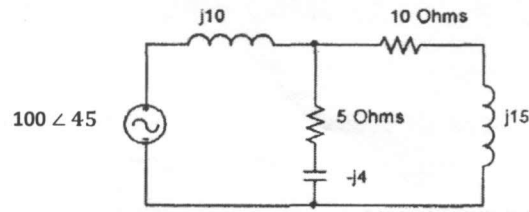


- b) Find the condition for symmetry and reciprocity of a 2 port network 06  
 c) Find  $I_2/I_1$  for the following network. 04



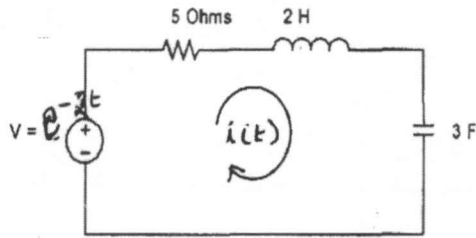
6. a) Find the voltage across  $10\Omega$  resistor using mesh analysis

08



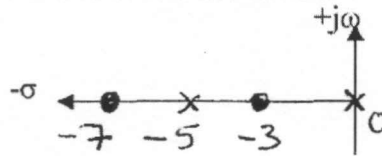
- b) Find  $i(t)$  using Laplace Transform the input voltage is  $e^{-2t}$ .

08



- c) The pole zero plot of a driving point admittance function is give below. Find the function if  $Z(-4) = 5$  and state whether it is RL, RC or LC function.

04



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