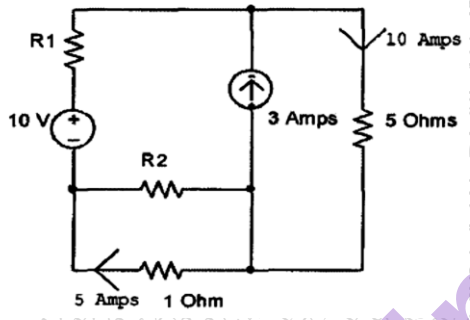
[Time: 3 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

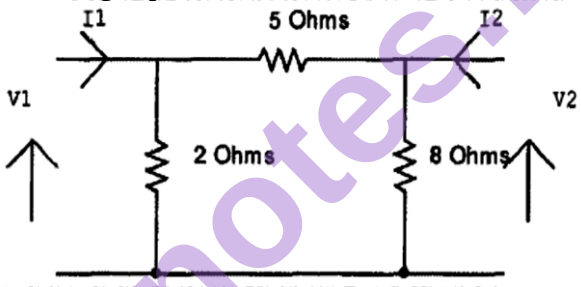
N.B: 1. Question one is compulsory.
2. Answer any three questions from the remaining five.
3. Assume suitable data if required.

1. Answer all the questions

a) Find R_1 and R_2 in the following circuit. 05

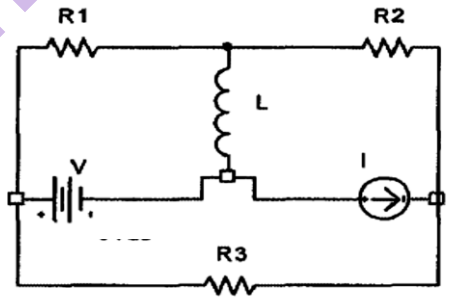


b) Find h parameters for the following 2-port network. 05

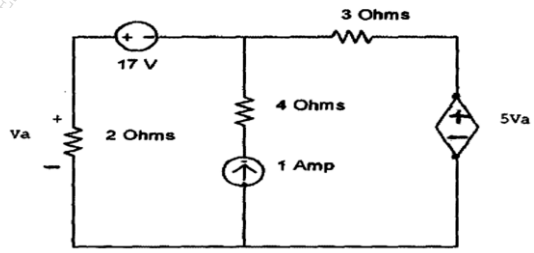


c) The poles of a driving point impedance function are at 0, -5, and zero at -2, find the function if Z(-3) = 1/6 and synthesize the same in cauer-I form. 05

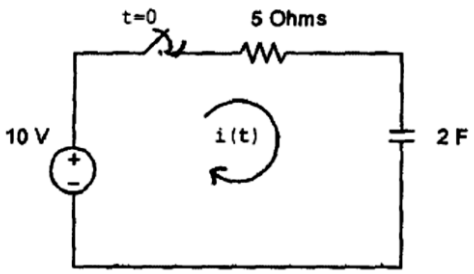
d) Draw the graph of the following network and obtain incidence matrix. 05



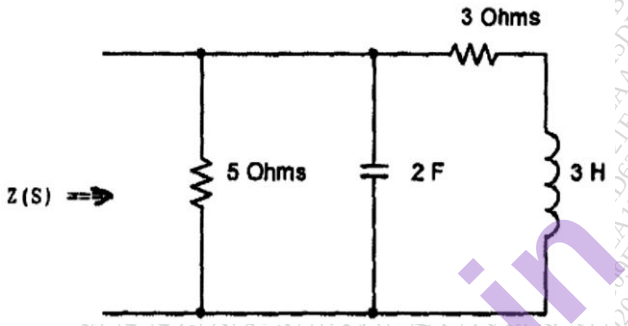
2. a) For the circuit shown below, find the current through 3 ohms resistor, using superposition theorem. 10



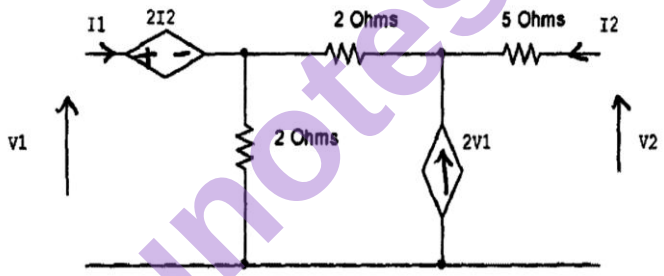
b) In the following series RC circuit the switch is closed at t=0, find the expression for the current through the capacitor and sketch i(t) versus t. 05



c) Find the driving point impedance for the following network. 05

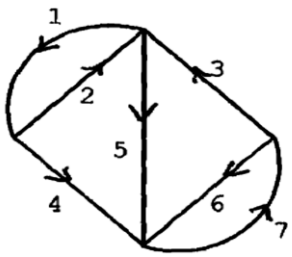


3. a) Find the ABCD parameters for the following 2-port network 10



b) Check whether the following functions are Hurwitz 05
i) $F(S) = S^5+4S^3+2S$
ii) $F(S) = S^5+2S^4+5S^3+10S^2+4S+8$

c) The graph of a network is given below. Obtain the tieset matrix. 05

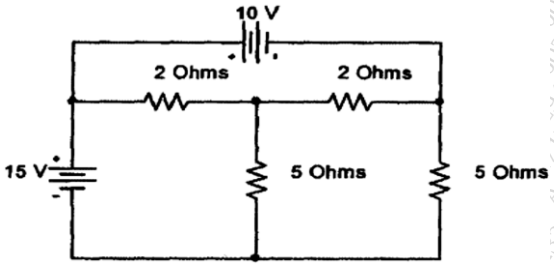


4. a) Synthesize the following driving point impedance function in Cauer-I and Foster-I forms. 10
$Z(s) = (S^2 + 2)(S^2 + 6)/3S(S^2 + 5)$

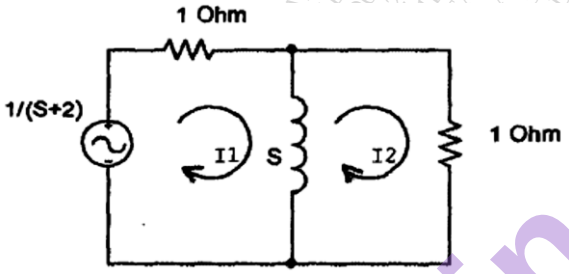
b) Obtain h parameters in terms of z parameters. 05

c) State and prove initial value theorem. 05

5. a) For the following network obtain the KVL equilibrium equation in matrix form using the concept of graph theory and hence find the link currents. 10



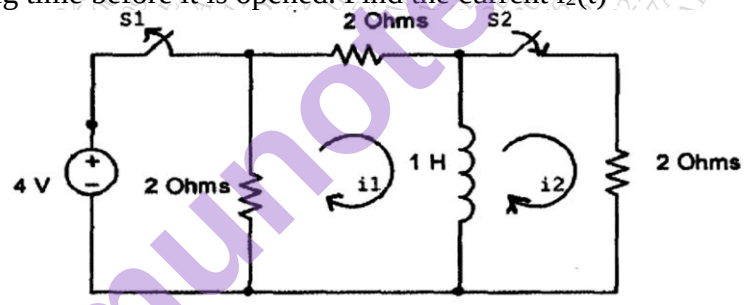
b) Find $I_2(S)$ for the following transformed circuit and hence find i_2 (t) using Inverse Laplace Transform. 05



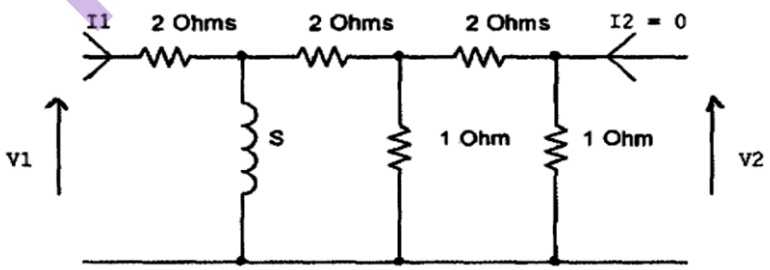
c) Test whether the following function is a Positive Real function. 05

$F(s) = (S^4+14S^2+45) / (S^3+7S)$

6. a) In the circuit given below, the switch S_1 is opened and the switch S_2 is closed at t=0. The switch S_1 was closed for a long time before it is opened. Find the current $i_2(t)$ 10



b) For the following ladder network find V_2 / V_1, I_1 / V_1 and V_2 / I_1 10



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