[Time: 3 Hours]   **[Marks:80]**
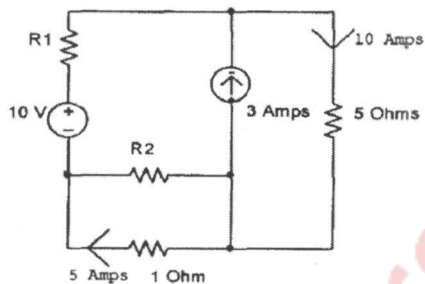
Please check whether you have got the right question paper.

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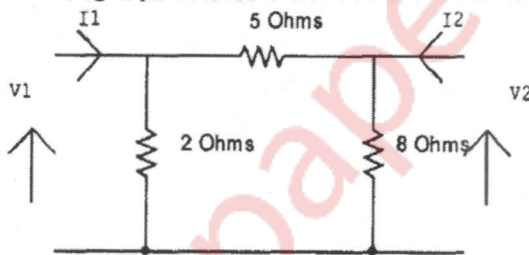3.   Assume suitable data if required.

1.   Answer all the questions
a) Find R_1 and R_2 in the following circuit.   05
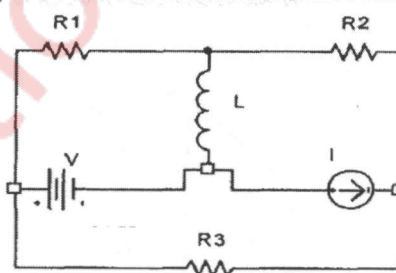

b) Find h parameters for the following 2-port network.   05

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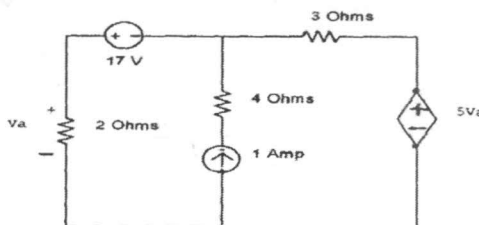
d) Draw the graph of the following network and obtain incidence matrix.   05

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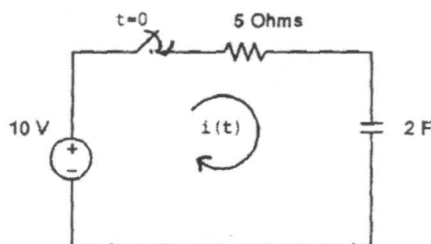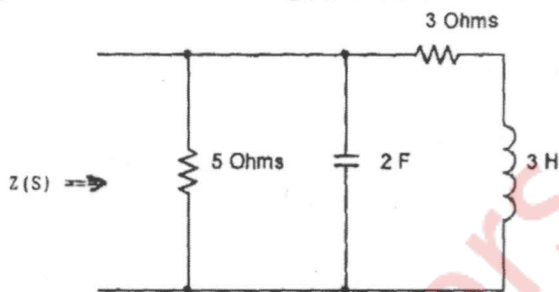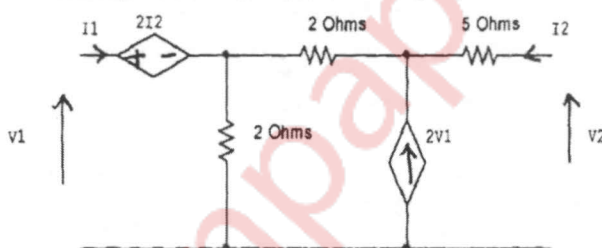theorem.

621EAA5DB662327A171E9460202730DB

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
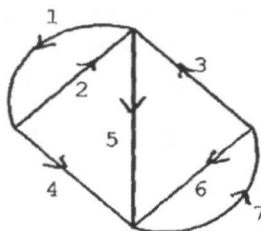

c) Find the driving point impedance for the following network.   05

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   10
of graph theory and hence find the link currents.
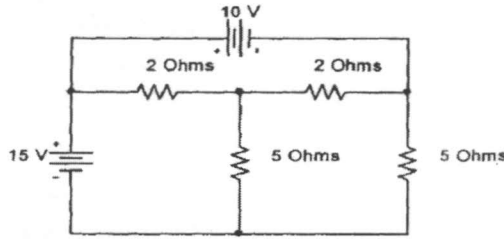
b) Find $I_2(S)$ for the following transformed circuit and hence find $i_2(t)$ using Inverse Laplace   05
Transform.
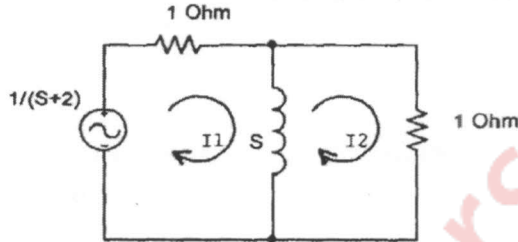
c) Test whether the following function is a Positive Real function.   05
$$F(s) = (S^4 + 14S^2 + 45) / (S^3 + 7S)$$

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 10
was closed for a long time before it is opened. Find the current $i_2(t)$
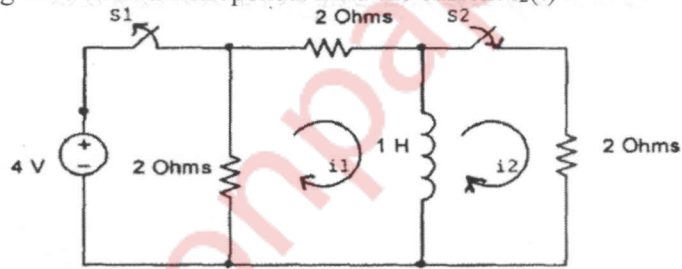
b) For the following ladder network find V_2 / V_1, I_1 / V_1 and V_2 / I_1 10

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