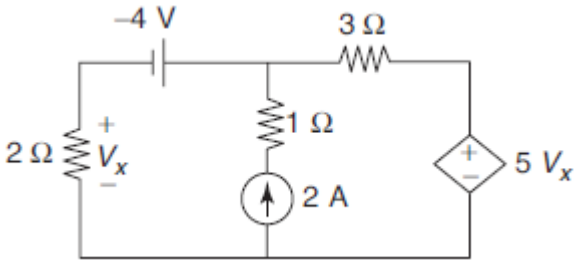
**Duration: 3hrs** **[Max Marks:80]**

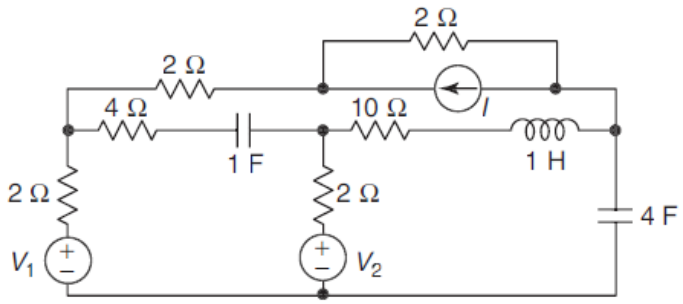
N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

Q1. All the questions are compulsory

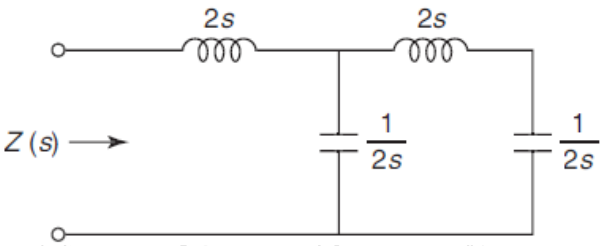
1. Find the current through the 3 ohm resistor (5 Marks)




2. Draw the oriented graph and find the incidence matrix for the following circuit. (5 Marks)



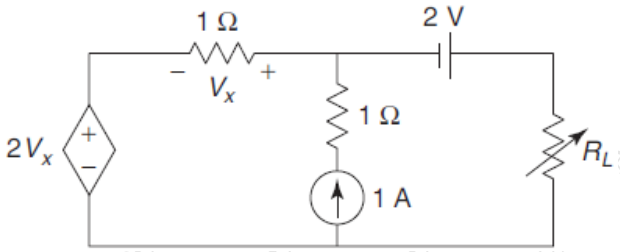

3. Determine the driving-point impedance of the network (5 Marks)



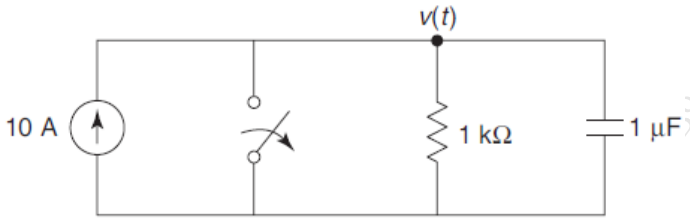

4. Derive the condition for reciprocity of Z parameters for two port networks (5 Marks)

Q2. Solve the following

1. Find the value of $R_L$ for maximum power (10 Marks)

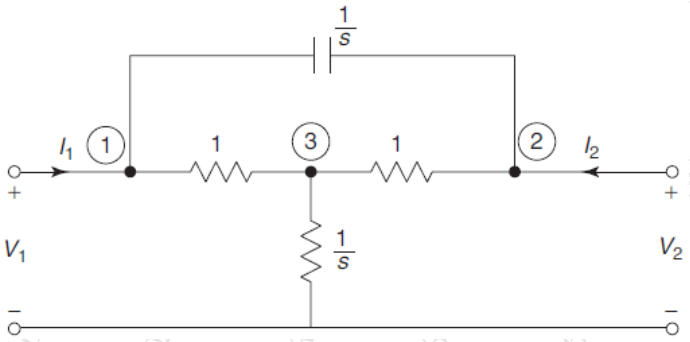



2. The switch is opened at t = 0. Solve for v , $\frac{dv}{dt}$ , $\frac{d^2v}{dt^2}$ at $t=0^+$ (10 Marks)

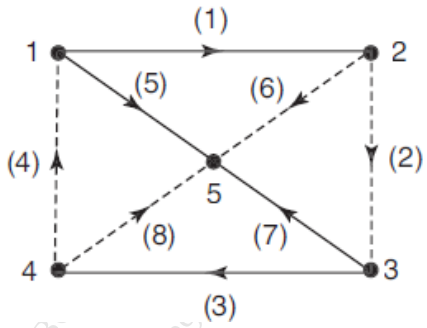



Q3. Solve the following

1. Determine Y-parameters for the network shown (10 Marks)

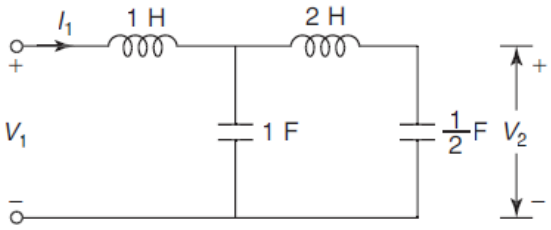



2. Write incidence matrix, tieset matrix and cutset matrix (10 Marks)

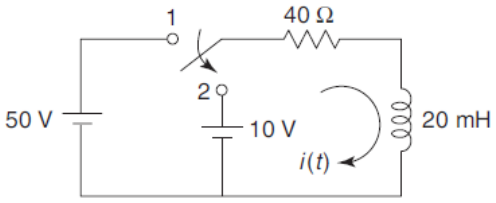


Q4. Solve the following

1. For the network shown determine $V_1/I_1$ and $V_2/I_1$. Plot the poles and zeroes of $V_2/I_1$ (10 Marks)

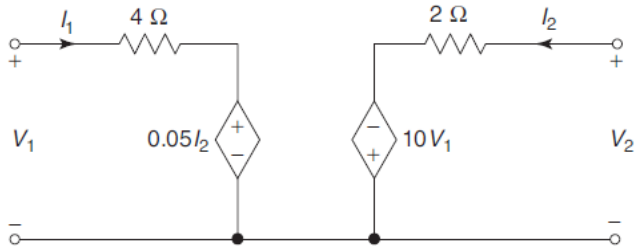



2. The switch is moved from position 1 to 2 at t = 0. The network was in steady state with switch at position 1. Obtain expressions for i(t) (10 Marks)

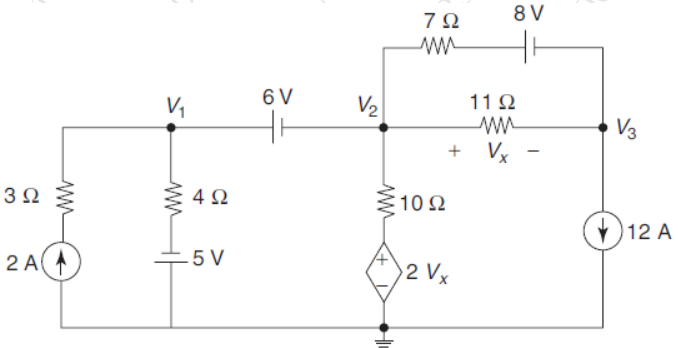



Q5. Solve the following

1. Determine Z parameters for the following network. State whether the given network is reciprocal or symmetrical (10 Marks)

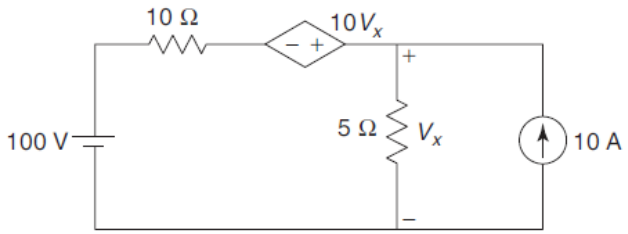



2. Find the voltage $V_x$ in the following circuit (10 Marks)

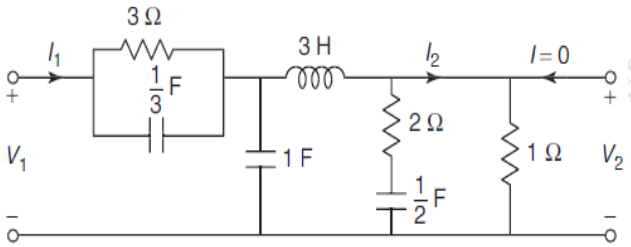


Q6. Solve the following

1. Determine the current through 10 ohm resistance using superposition theorem (10 Marks)




2. For the network shown , determine $V_2/V_1$, $I_2/I_1$ (10 Marks)

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