14/11/2024   ELECTRICAL   SEM-III   C SCHEME   ECA   QP. CODE: 10065677

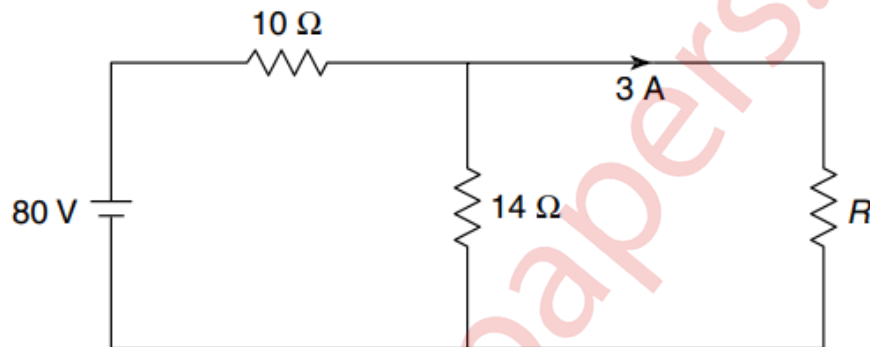**3 Hours**   **Total Marks: 80**

Note:
- Question No. 1 is compulsory.
- Answer any **three** from the remaining five questions.
- Assume suitable data if necessary and justify the same.

Q1   Each question carries five marks   **20M**
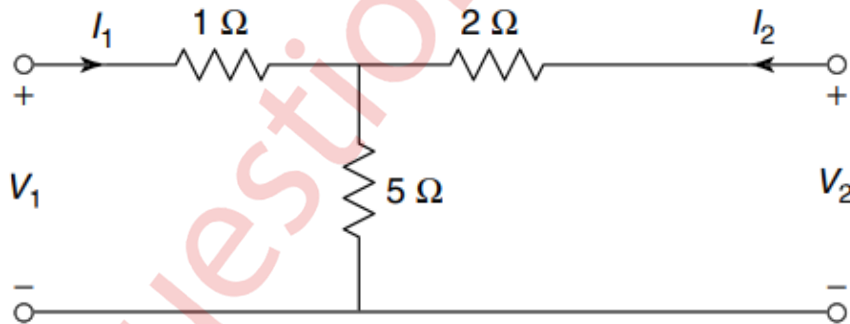
a   Determine the resistance 'R' in the following circuit
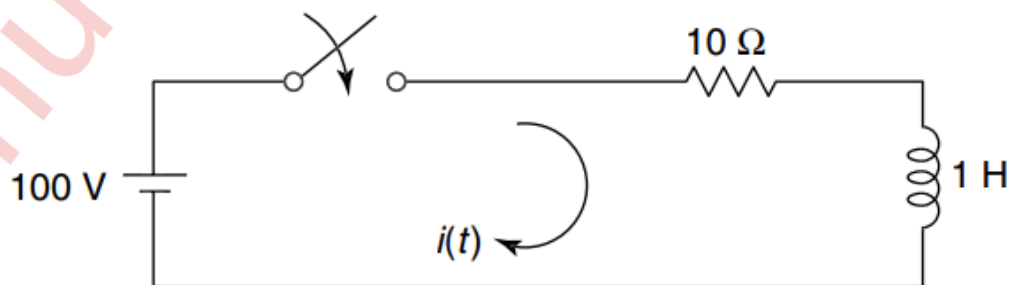

b   What are the restrictions on pole and zero locations for Transfer Functions?
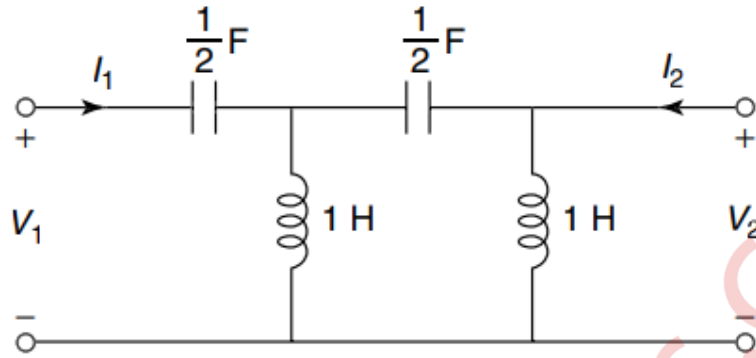
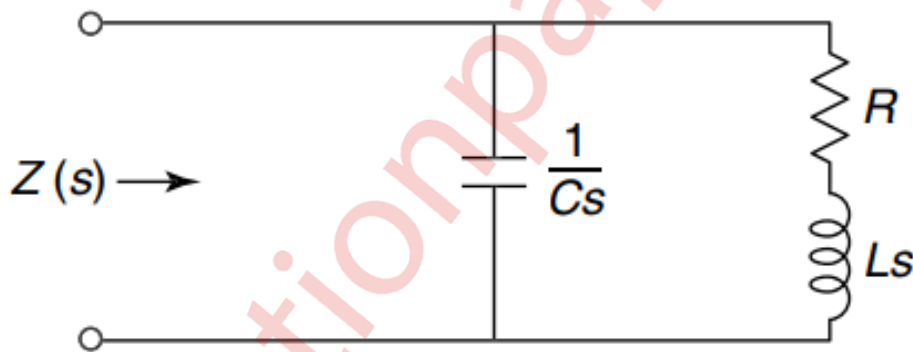c   For the given network, determine the transmission parameters

d   In the given network switch is closed at $t=0$. With zero current in the inductor, find
i and $\frac{di}{dt}$ at $t=0+$

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Q2 a Derive Z parameters in terms of Y parameters and hybrid parameters **10M**

  b Find the current I_y in the following circuit using Superposition theorem. **10M**

Q3 a Find the value of the resistance R_L in the following circuit, for maximum power transfer, and calculate the maximum power. **10M**

  b For the given network the switch is moved from a to b, at $t = 0$. Determine V(t) using Laplace Transform. **10M**

Q4   a   Determine hybrid parameters of the given network.   **10M**

b   The voltage V(s) of a network is given by $V(s) = \dfrac{3s}{(s+6)(s^2+3s+3)}$. Plot its pole zero   **10M**

diagram and hence obtain v(t). For the given network, poles and zeros of driving point function Z(s) are, Poles: $(-1 \pm j4)$; zero: -2. If $Z(j0) = 1$, determine the values of R, L and C.
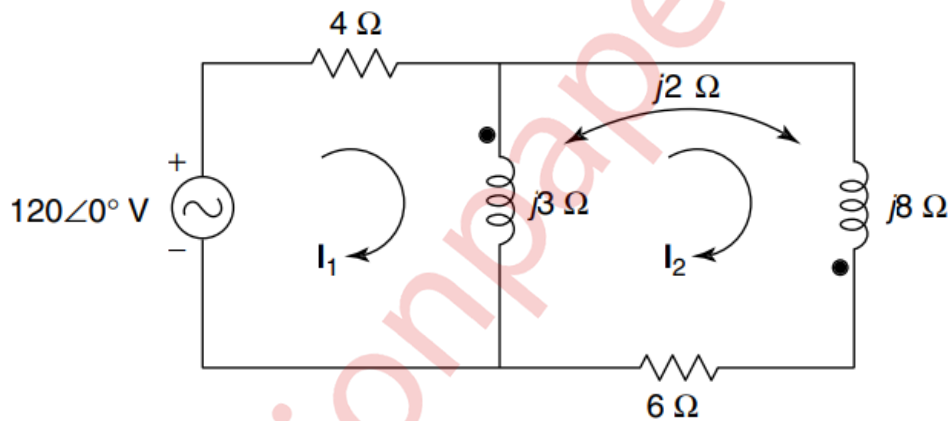

Q5   a   For the given ladder network, determine the voltage transfer function V_2/V_1 **10M**

X525Y36095EX525Y36095EX525Y36095EX525Y36095E
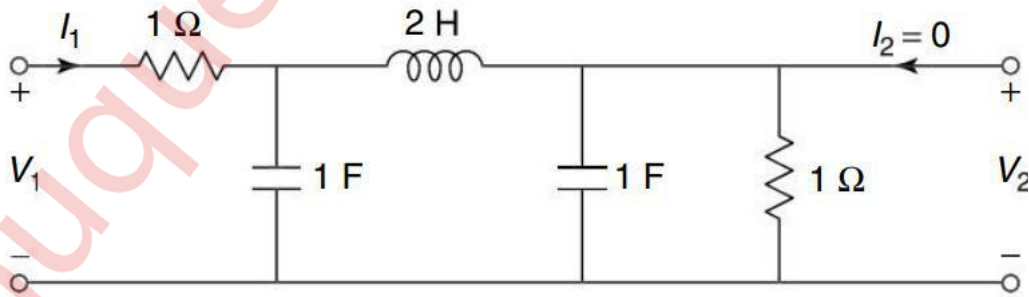
b   Determine the impulse response of the current i(t) in the following network.   **10M**
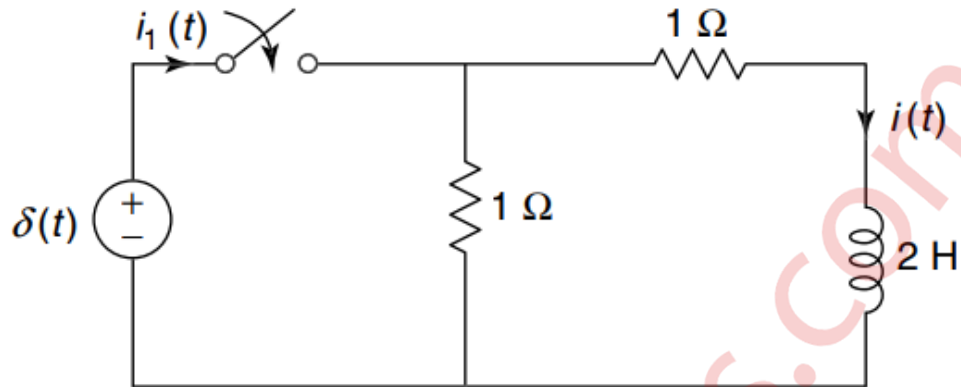
Q6   a   Find the current through the 6Ω resistor in the following circuit using mesh analysis.   **10M**

b   For the given network draw oriented graph and write the (i)reduced incidence matrix   **10M**
    (ii) tieset matrix and (iii) fundamental cutset matrix.

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