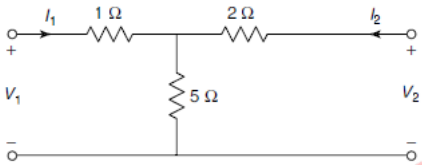
Time: 3 Hours **Marks: 80**

Note:

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

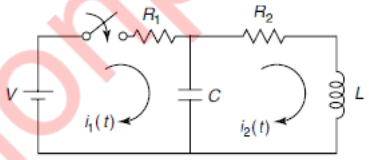
Q.1 Each question carries five marks. **20M**

a. Find the transmission parameters for the network shown in Fig

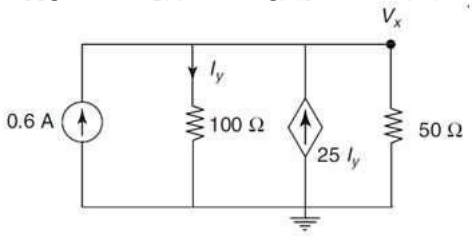


b. The voltage V(s) of a network is given by $V(s) = \frac{(s+8)(s+10)}{(s+4)(s^2+2s+2)}$. Plot its pole-zero diagram.

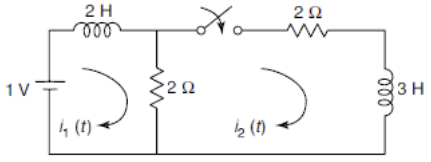
c. In the network shown in Fig. , assuming all initial conditions as zero, find $i_1(0+)$ and $i_2(0+)$



d. For the network shown in Fig. , find the voltage V_x.



Q.2 a. In the network shown in Fig. , the switch is closed at t = 0, the steady-state being reached before t = 0. Determine current through inductor of 3 H. **10M**



X525YF1E2E2X525YF1E2E2X525YF1E2E2X525YF1E2E2

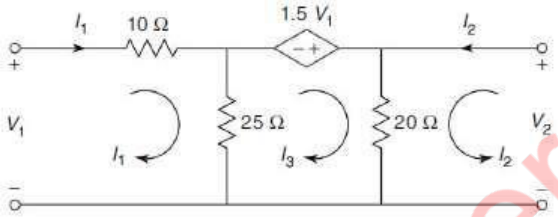
b. The reduced incidence matrix of an oriented graph is **10M**

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

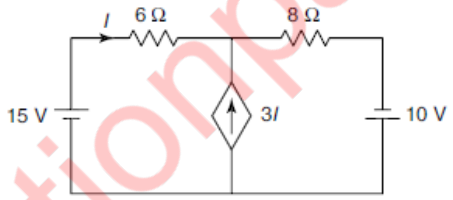
(a) Draw the graph. (b) How many trees are possible for this graph?

(c) Write the tieset and cutset matrices.

Q.3 a. Find transmission parameters for the two-port network shown in Fig. **10M**

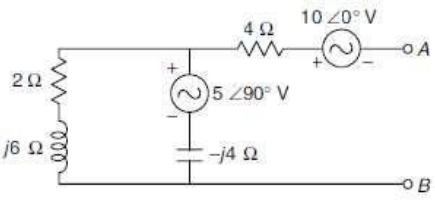


b. Find the current through the 6 Ω resistor using superposition theorem. **10M**



Q.4 a. Express Z parameters in terms of Y parameters and h parameters. **10M**

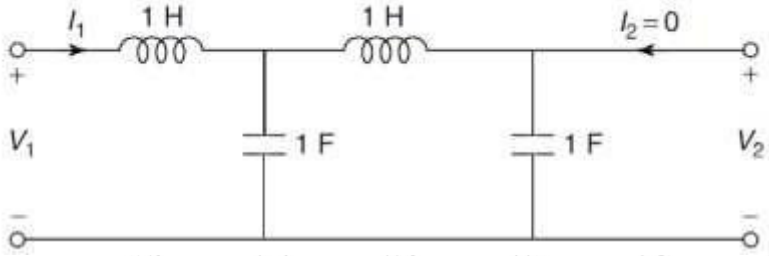
b. Obtain Thevenin's equivalent network for Fig. **10M**



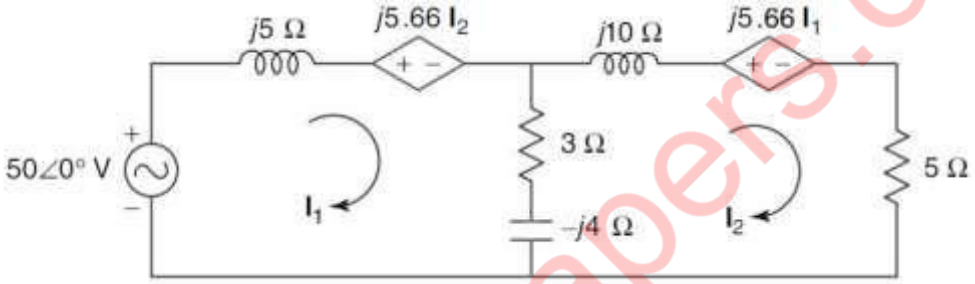
X525YF1E2E2X525YF1E2E2X525YF1E2E2X525YF1E2E2

Q.5 a. Derive the condition for reciprocity and symmetry for A-B-C-D parameters **10M**

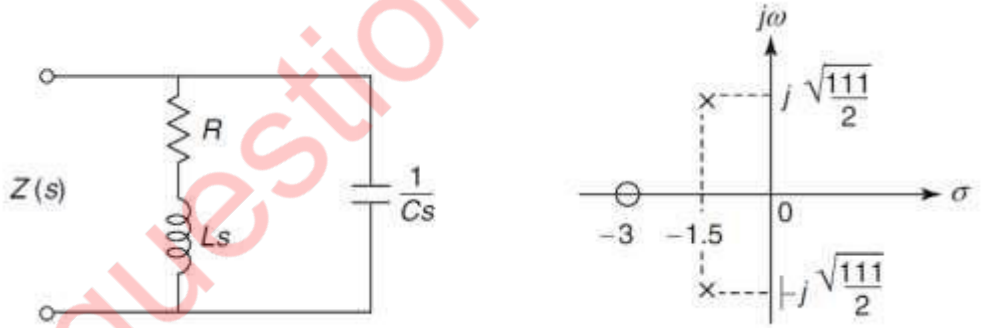
b. For the given ladder network, determine voltage transfer function V2/V1. **10M**



Q.6 a. Find the voltage across the 5 Ω resistor in Fig. using mesh analysis. **10M**



b. A network and its pole-zero configuration are shown in Fig. Determine the values of R, L and C if Z (j0) = 1. **10M**



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X525YF1E2E2X525YF1E2E2X525YF1E2E2X525YF1E2E2