

Time: 3 Hours

Max. Marks: 80

N. B. Question No. 1 Compulsory

Question No. 2 to Question No. 6 Solve any Three

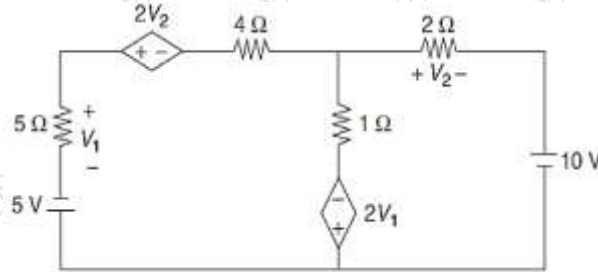
Q1

Solve any Four out of Six

5 marks each

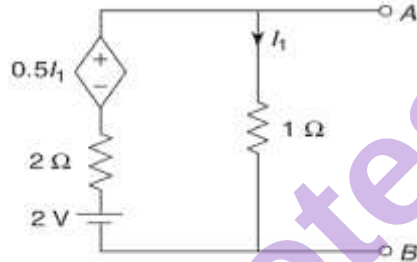
Find the Mesh Currents in the Network Shown.

A



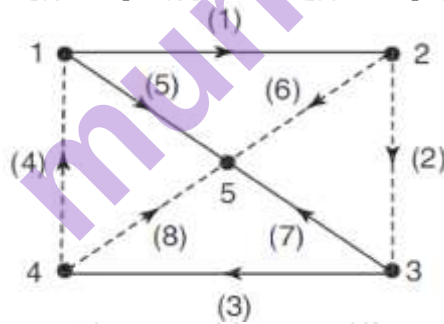
Find the Norton's equivalent Network.

B



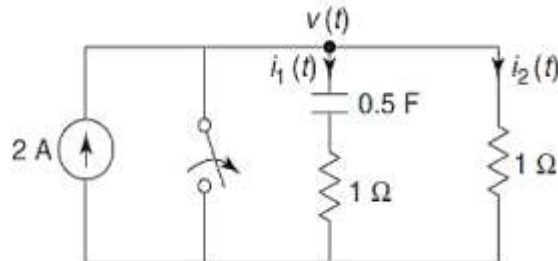
For the Graph shown, write the complete incidence matrix and tiset matrix.

C



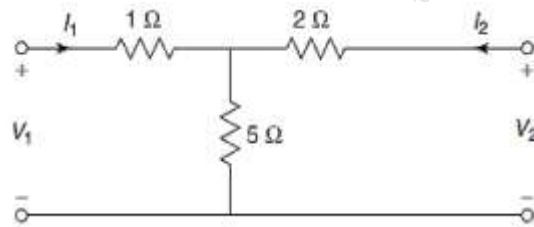
In the network, the switch is closed for a long time and at $t=0$ switch is opened. Determine the current through the capacitor.

D



E

Find the transmission parameter for the network shown.



Test whether, $F(s)$ is a positive real function.

F

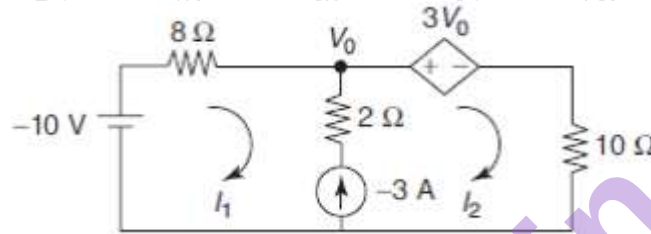
$$F(s) = \frac{s+3}{s+1}$$

Q2

10 marks each

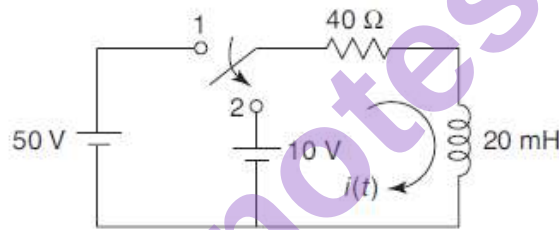
In the network Shown Find I_1 and I_2

A



The Network shown in Figure is under steady state with switch at position -1. At $t=0$ the switch is moved to position 2. Find $i(t)$.

B

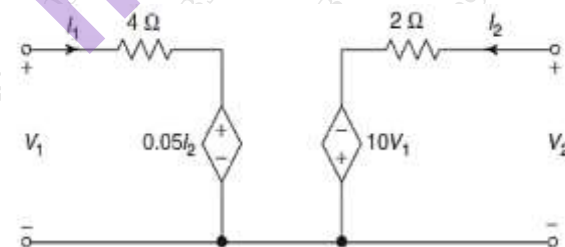


Q3.

10 marks each

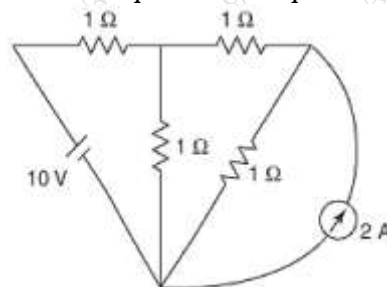
A

Determine Z and Y parameters of the Network shown.



B

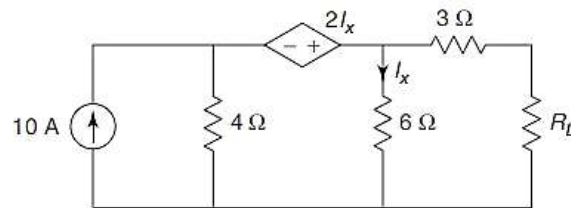
For the Network shown, write down the f -cutset matrix and obtain the Network equilibrium equation in matrix form using KCL.



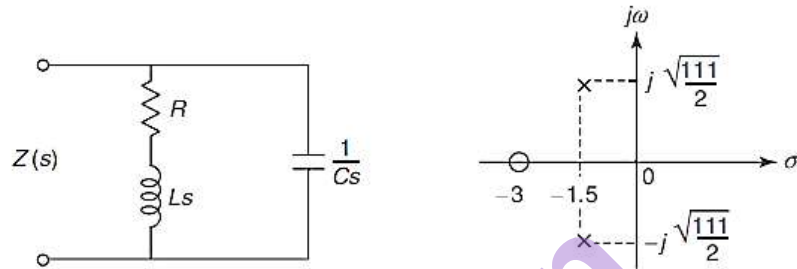
Q4.

10 marks each

- A For the network shown, Calculate the maximum power that may be dissipated in the load resistor R_L .



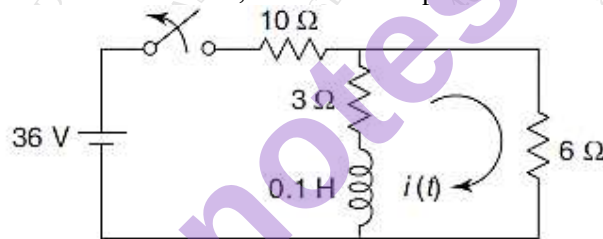
- B A Network and its pole zero plot configuration is shown in figure. Determine the values of R, L and C if $Z(j0) = 1$



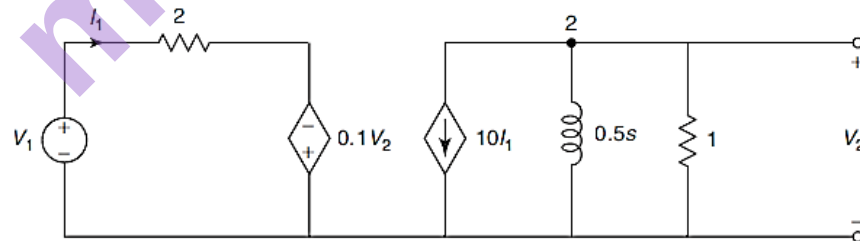
Q5.

10 marks each

- A In the network shown, the switch is opened at $t = 0$. Find $i(t)$



- B Find the Driving point admittance function and draw the pole zero plot of the Network Shown.



Q6.

10 marks each

- A Test whether the polynomial is Hurwitz

$$P(s) = s^4 + 5s^3 + 5s^2 + 4s + 10$$

- B

Realise Cauer forms of the following LC impedance function:

$$Z(s) = \frac{10s^4 + 12s^2 + 1}{2s^3 + 2s}$$