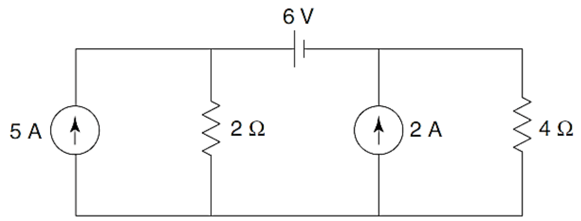
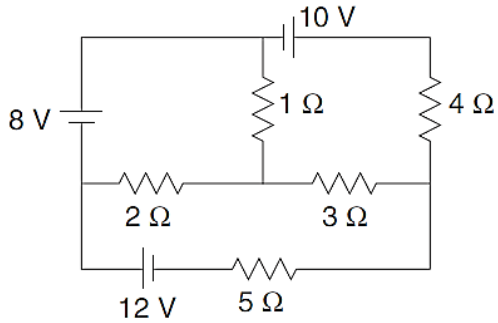
Electrical Engineering Department
Subject: Network Theory
Question Bank

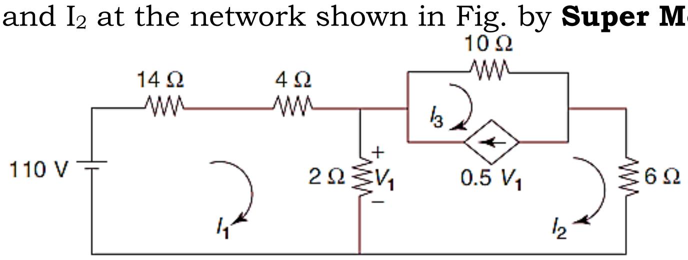
Q.1 Find the current in the 4 ohm resistor shown in network of Fig. by **Source Transformation.**



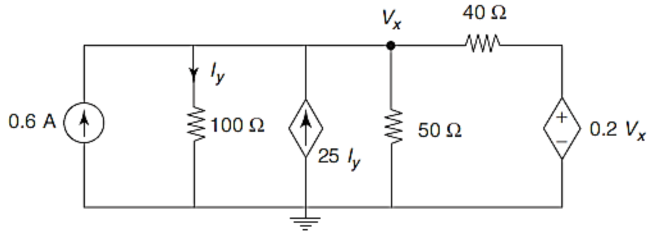
Q.2 Determine the current through the 5 ohm resistor of the network shown in Fig. by **Mesh Analysis.**



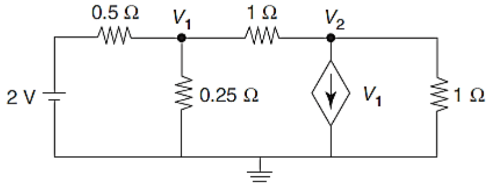
Q.3 Find the currents I_1 and I_2 at the network shown in Fig. by **Super Mesh Analysis.**



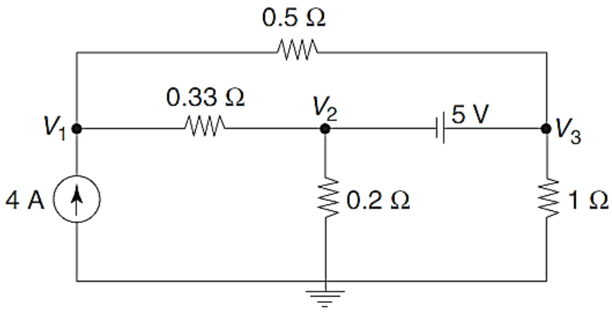
Q.4 For the network shown in Fig., find the voltage Vx by **Nodal Analysis Method**



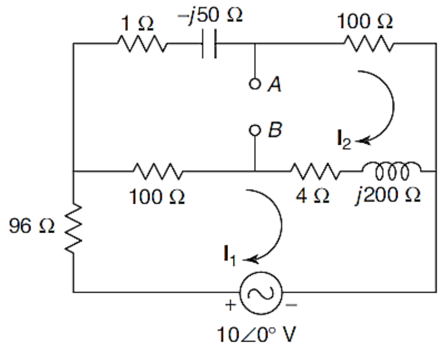
Q.5 Determine the voltages V_1 and V_2 in the network of Fig. by **Nodal Analysis Method**



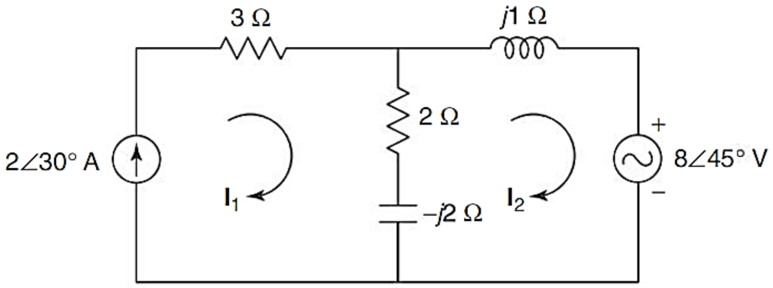
Q.6 In the network of Fig. , find the node voltages V_1, V_2 and V_3. by **Supernode Analysis Method**



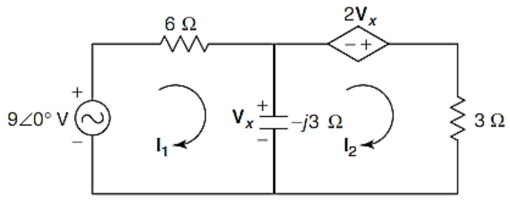
Q.7 Find the voltage V_{AB} in the network of Fig.by **Mesh Analysis Method**



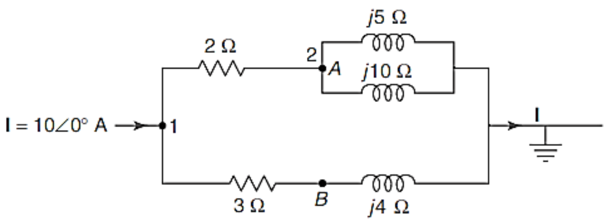
Q.8 Find the voltage across the 2 ohm resistor in the network of Fig. by **Mesh Analysis Method**



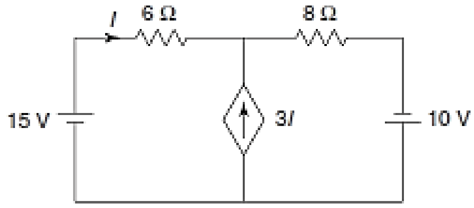
Q.9 Find the currents I_1 and I_2 in the network of Fig. by **Mesh Analysis Method**



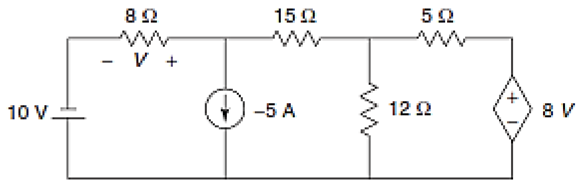
Q.10 Find the voltage V_{AB} in the network of Fig. by **Nodal Analysis Method**



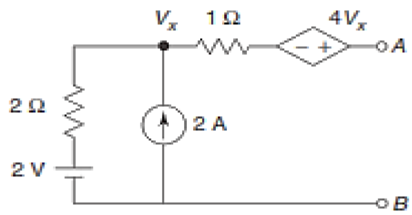
Q.1 Find the current through the 6 ohm resistor in Fig. by **Superposition Theorem.**



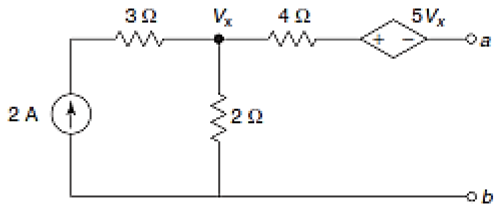
Q.2 Find the voltage V in the network of Fig. By **Superposition Theorem.**



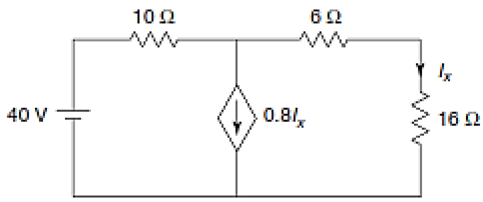
Q.3 Obtain the **Thevenin** equivalent network of Fig. for the terminals A and B.



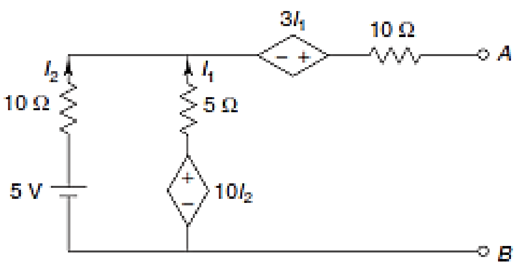
Q.4 Obtain the **Thevenin** equivalent network of Fig. 2.176 for the given network at terminals a and b.



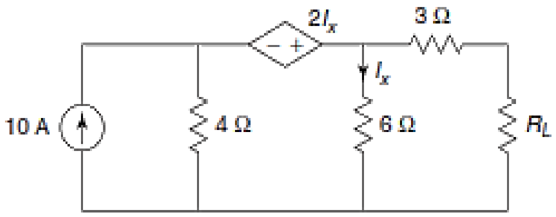
Q.5 Determine the current in the 16 ohm resistor in Fig. by **Thevenins Theorem**



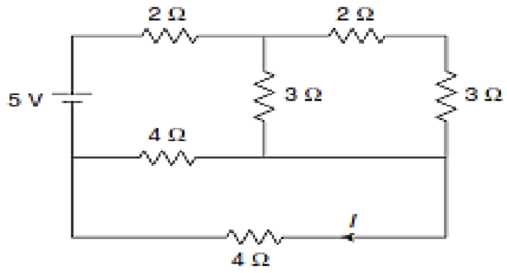
Q.6 Find **Norton's** equivalent network across terminals A and B of Fig.(88)



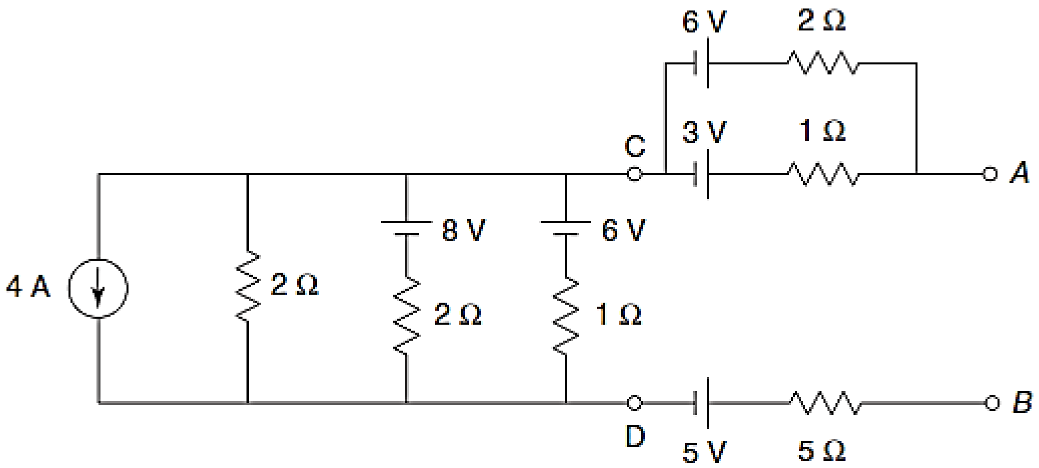
Q.7 For the network shown in Fig. calculate the **Maximum Power** that may be dissipated in the load resistor R_L.



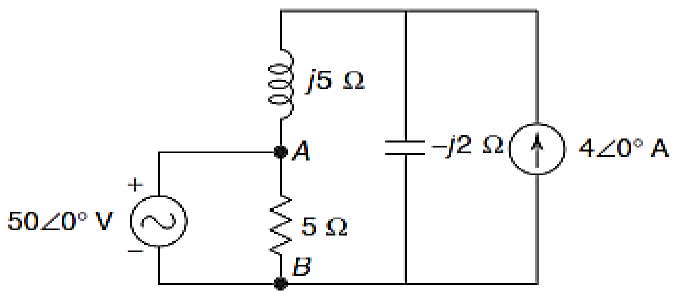
Q.8 Find the current I and verify **Reciprocity Theorem** for the network shown in Fig.



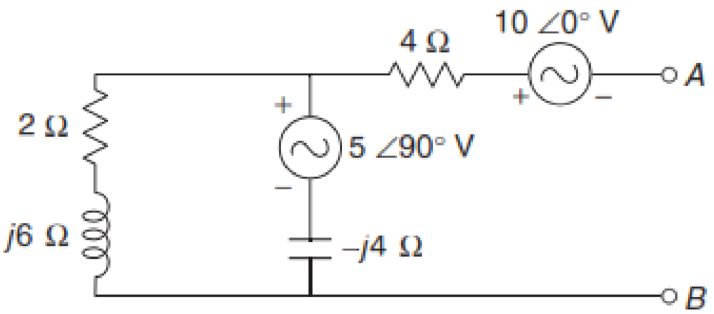
Q.9 Draw **Millman's** equivalent network across terminals AB in the network of Fig.



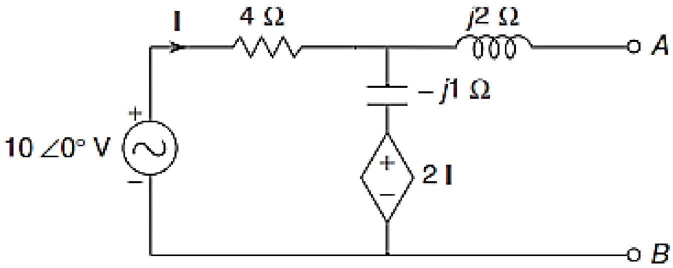
Q.10 Determine the voltage V_{AB} for the network shown in Fig. By **Superposition Theorem**.



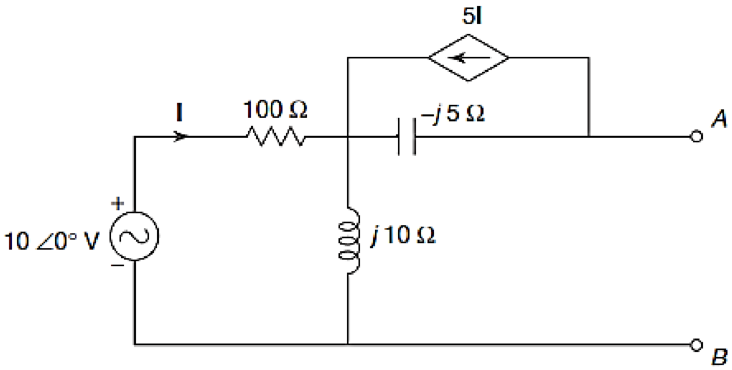
Q.11 Obtain **Thevenin's** equivalent network for Fig.



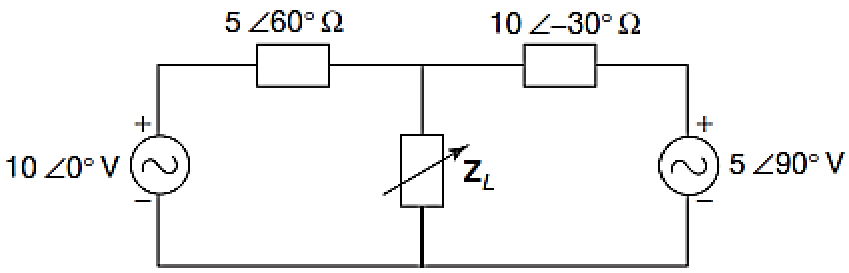
Q.12 Obtain **Thevenin's** equivalent network across terminals A and B in Fig.



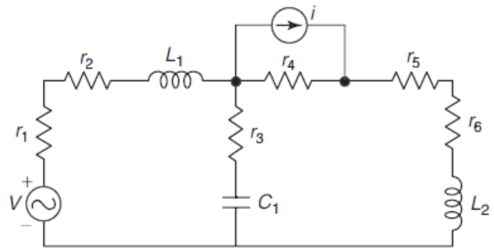
Q.13 Obtain **Norton's** equivalent network across the terminals A and B in Fig.



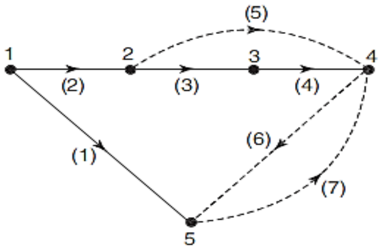
Q.14 In the network shown in Fig., find the value of Z_L for which the power transferred will be maximum. Also find **Maximum Power**.



Q.1 For the circuit shown in Fig. draw the oriented graph and write (a) incidence matrix, (b) tieset matrix, and (c) cutset matrix.



Q.2 For the graph shown in Fig. write the incidence matrix, tieset matrix and f-cutset matrix.



Q.3 State and Explain following types of filters ,
i. Low pass Filter, ii. High pass Filter, iii. Band pass Filter, iv. Band stop Filter

Also plot the response of Attenuation constant, Phase constant, Characteristics impedance.

Q.4 Each of the two series elements of a T-section low-pass filter consists of an inductor of 60 mH having negligible resistance and a shunt element having a capacitance of 0.2 μF. Calculate (a) the cut-off frequency, (b) nominal impedance, and (c) characteristic impedance at frequencies of 1 kHz and 5 kHz

Q.5 Design a T-section constant-k high-pass filter having a cut-off frequency of 10 kHz and a design impedance of 600 ohm. Find its characteristic impedance and phase constant at 25 kHz

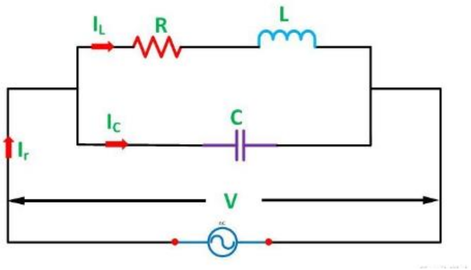
Q.6 Define following terms with respect to series resonant circuit,

Impedance, Resonant frequency, Current, Power Factor, Q factor

Also, Prove that Prove that Bandwidth =(R/L).

Q.7 A series RLC circuit when connected to 230V, 50Hz supply, the maximum current obtained is 2A. The voltage across capacitor is 500V. Calculate resistance, inductance, capacitance, resonant frequency of the circuit.

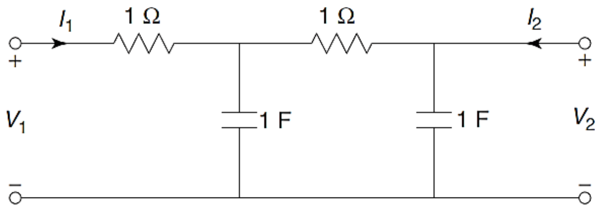
Q.8 Find the resonant frequency for the network shown in figure.



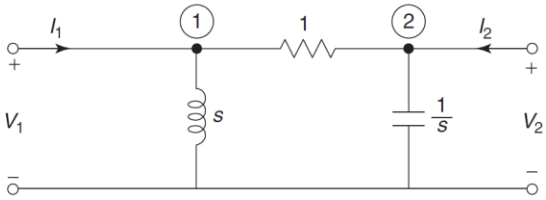
Q.9 Define Band width and Prove that P1=P2=(Po/2), where P1, P2- half power and Po- resonance power.

Q.10 a. Define Z, Y, ABCD, H-parameter.
b. Express Z-parameter in terms of Y, ABCD, H-parameter.
c. Express Y-parameter in terms of Z, ABCD, H-parameter.

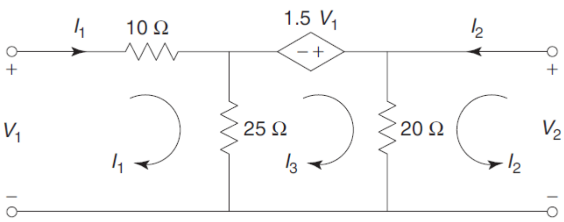
Q.11 Determine the short-circuit admittance parameters for the network shown in Fig



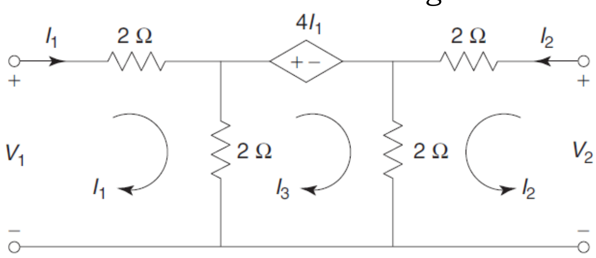
Q.12 Determine the transmission parameters for the network shown in Fig.



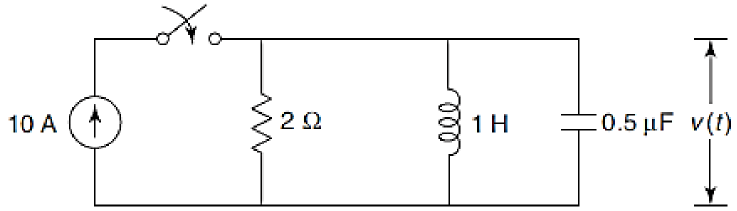
Q.13 Find transmission parameters for the two-port network shown in Fig.



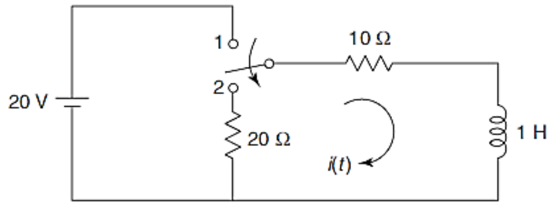
Q.14 Find Z and h-parameters for the network shown in Fig.



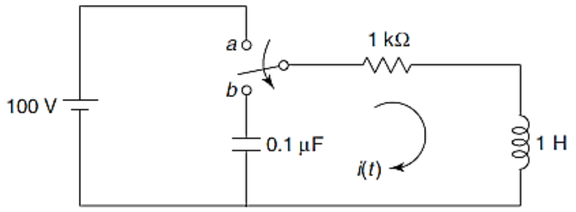
Q.1 For the network shown in Fig., the switch is closed at t = 0, determine v, dv/dt, and d^2v/d^2t at t = 0+.



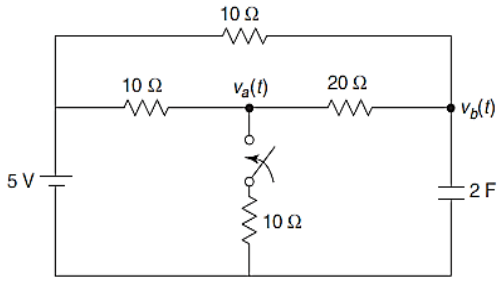
Q.2 In the network shown in Fig., the switch is changed from the position 1 to the Position 2 at t = 0, steady condition having reached before switching. Find the values of I, di/dt, and d^2i/dt^2 at t = 0+.



Q.3 In the network of Fig., the switch is changed from the position 'a' to 'b' at t = 0. Solve for I, di/dt, and d^2i/dt^2 at t = 0+.di



Q.4 In the accompanying Fig. is shown a network in which a steady state is reached With switch open. At t = 0, switch is closed. Determine va (0–), va (0+), vb(0–) and vb (0+).

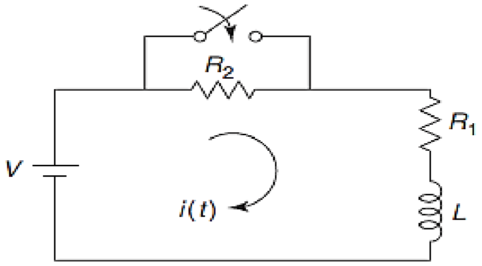


Q.5 Derive an expression for analysis of

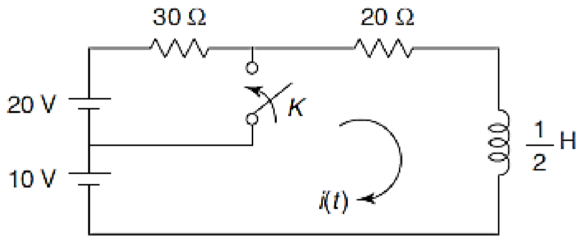
1. Series RL Circuit
2. Series RC Circuit
3. Series RLC Circuit

Also Draw the response for it.

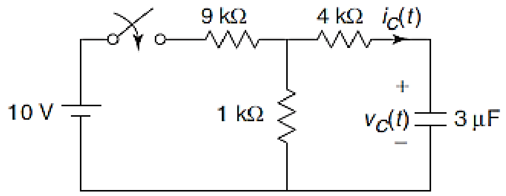
Q.6 In the network shown in Fig., the switch is closed at t = 0, a steady state having Previously been attained. Find the current i (t).



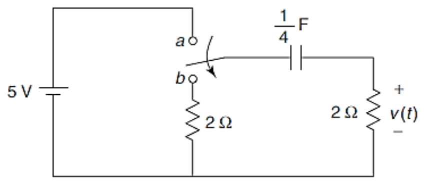
Q.7 In the network of Fig., a steady state is reached with the switch K open. At t = 0, the switch K is closed. Find the current i(t) for t = 0.



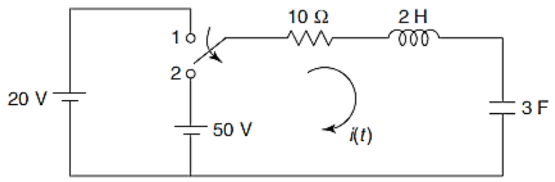
Q.8 In the network shown in Fig., the switch closes at t = 0. The capacitor is initially uncharged. Find Vc(t) and ic(t).



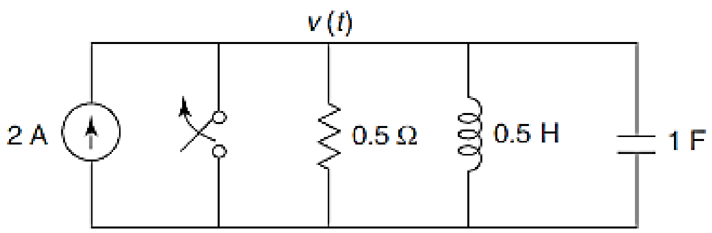
Q.9 In the network shown, the switch is shifted to position b at t= 0. Find v (t) for t = 0.



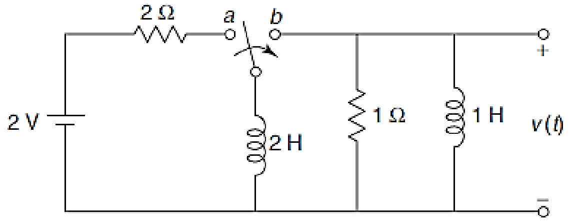
Q.10 In the network shown in Fig., the switch is moved from the position 1 to 2 at t=0. The switch is in the position 1 for a long time. Determine the expression for the current i(t).



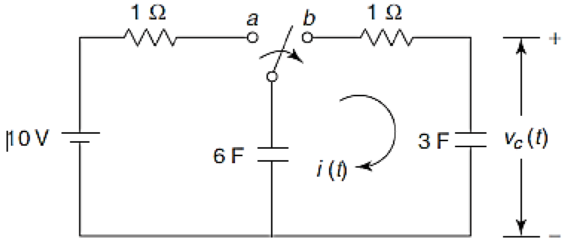
Q.11 In the network of Fig., the switch is opened at t = 0 obtain the expression for v(t). Assume zero initial conditions.



Q.12 The network of Fig. was initially in the steady state with the switch in the position a. At t = 0, the switch goes from a to b. Find an expression for voltage v (t) for t = 0 using Laplace transform



Q.13 In the network of Fig., the switch is moved from a to b at t = 0. Determine i (t) and vc (t)using Laplace transform.



Q.14 Find the impulse response of the voltage across the capacitor in the network shown in Fig. Also determine response Vc(t) for step input using Laplace transform.