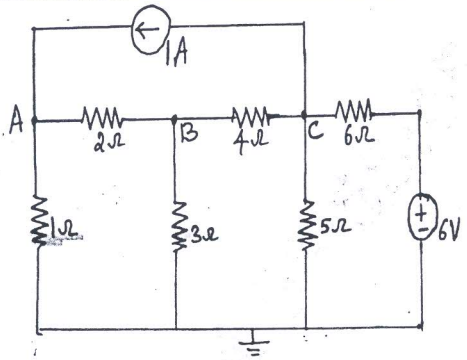
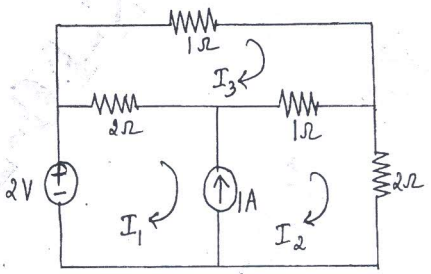
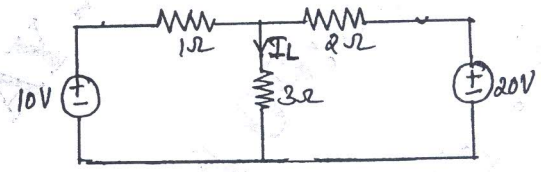
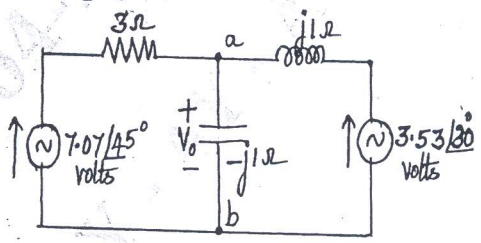
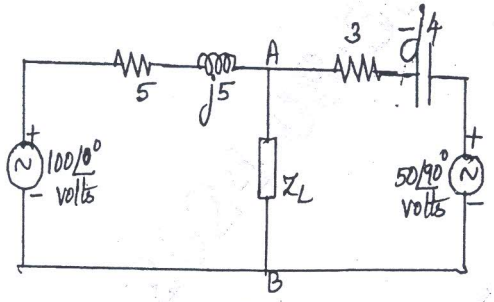
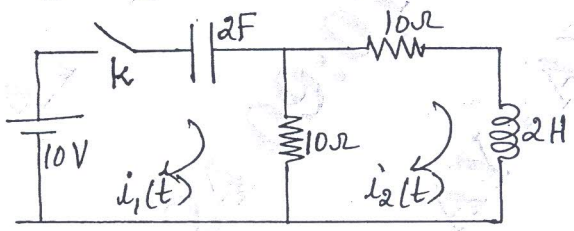
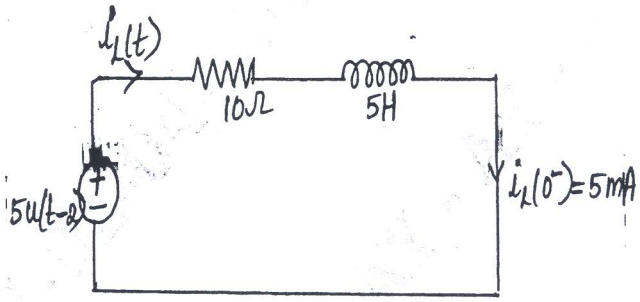
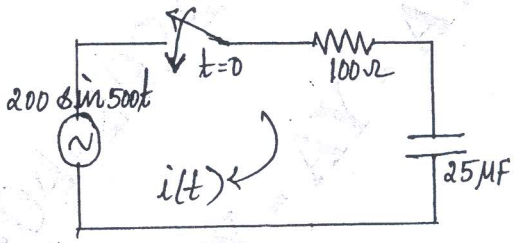
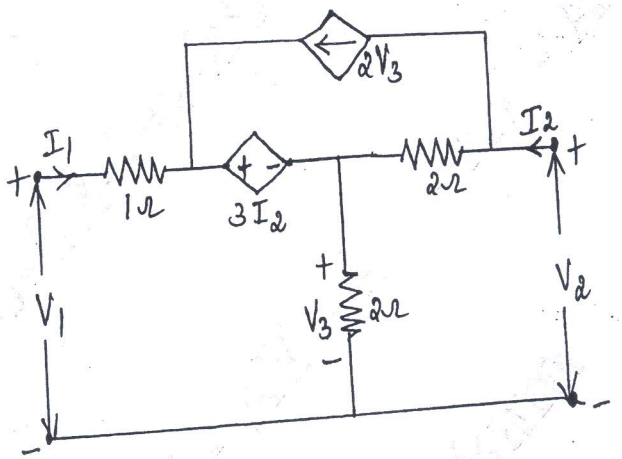


Fig Q2(b)

	c.	For the network of Fig Q2(c), find the currents I_1, I_2 and I_3.  Fig Q2(c)	6	L3	CO1
		Module – 2			
Q.3	a.	State Thevenin's theorem.	2	L2	CO2
	b.	Find the current through 3Ω resistor using superposition theorem for Fig Q3(b)  Fig Q3(b)	8	L2	CO2
	c.	Obtain the Norton's and Thevenin's equivalent circuit at terminals 'a' and 'b' for the network of Fig Q3(c). Find 'V_0'  Fig Q3(c)	10	L3	CO2
		OR			
Q.4	a.	State Norton's theorem and draw the Norton's equivalent circuit.	2	L12	CO2

	b.	Obtain the condition for maximum power transfer in a circuit with AC source with source impedance Z_s connected to a load with variable resistance and variable reactance.	8	L2	CO2
	c.	Determine the maximum power transferred to the load Z_L in the network of Fig Q4(c)  Fig Q4(c)	10	L3	CO2
		Module – 3			
Q.5	a.	Define : i) Resonance ii) Quality factor iii) Bandwidth.	4	L1	CO3
	b.	Show that $f_0 = \sqrt{f_1 f_2}$, where f_1 and f_2 are the half power frequencies of a resonant circuit.	6	L2	CO3
	c.	In the network of Fig Q5(c), the switch K is closed at t = 0. Determine the values of i_1, i_2, $\frac{di_1}{dt}$ and $\frac{di_2}{dt}$ at $t = 0^+$.  Fig Q5(c)	10	L3	CO3
		OR			
Q.6	a.	What are initial conditions? Show the behaviour of R, L, C elements at the time of switching at t = 0 both at $t = 0^+$ and $t = \infty$.	6	L1	CO3
	b.	Derive the condition for parallel resonance when RL is connected parallel to RC.	6	L2	CO3
	c.	A series connected RLC circuit has R = 4Ω, L = 25mH ; calculate the value of C such that Q = 50. Also calculate the resonant frequency, upper and lower half power frequencies.	8	L3	CO3

		Module – 4			
Q.7	**a.**	State and prove the following : i) Initial value theorem ii) Final value theorem	**6**	**L2**	**CO4**
	b.	Find the Laplace transform of the following functions : i) $f(t) = e^{-at}$; for $t \geq 0$ ii) $f(t) = K$; for $t \geq 0$	**4**	**L1**	**CO4**
	c.	Solve for $i_L(t)$ using Laplace transformation for the network of Fig Q7(c)  Fig Q7(c)	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	Find the Laplace transform of unit step, unit impulse and unit ramp function.	**4**	**L1**	**CO4**
	b.	Verify initial and final value theorems for the function $f(t) = 1 + e^{-t}(\sin t + \cos t)$.	**6**	**L2**	**CO4**
	c.	For the circuit of Fig Q8(c), find the expression for current if the switch is closed at t = 0. Determine the value of current at t = 1ms. Assume initial charge on the capacitor as zero.  Fig Q8(c)	**10**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Define Z – parameters with necessary equations.	**4**	**L1**	**CO5**
	b.	Derive Z – parameters in terms of T – parameters.	**6**	**L2**	**CO5**

	c.	A 3 - ϕ, 3 – wire, 400V delta connected load has impedances $Z_{ab} = 10\angle 0\ \Omega$, $Z_{bc} = 10\angle -30^\circ\ \Omega$ and $Z_{ca} = 10\angle 30^\circ \Omega$. The phase sequence is abc. Determine the phase currents and line currents.	10	L3	CO5
		OR			
Q.10	a.	Define T- parameters with necessary equations.	4	L1	CO5
	b.	Derive Y-parameters in terms of Z-parameters.	6	L2	CO5
	c.	Obtain the Z-parameters for the circuit of Fig Q10(c)  Fig Q10(c)	10	L3	CO5

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