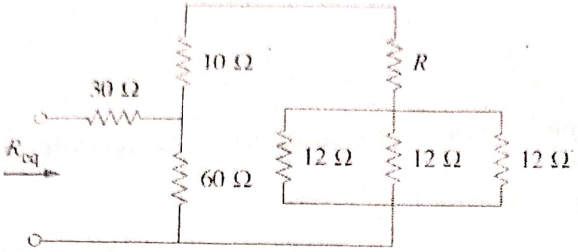
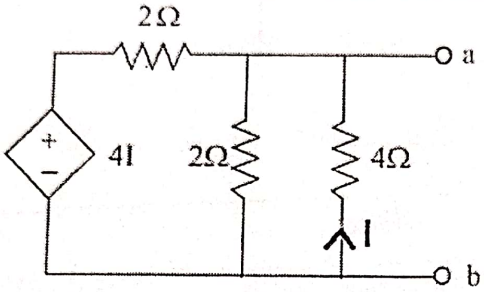
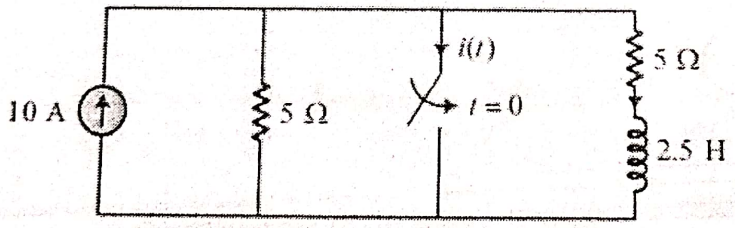
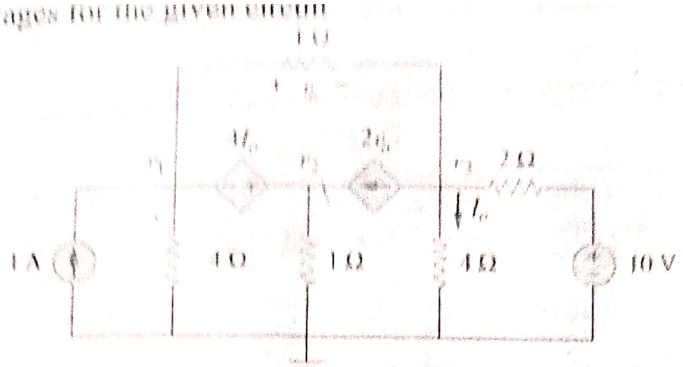
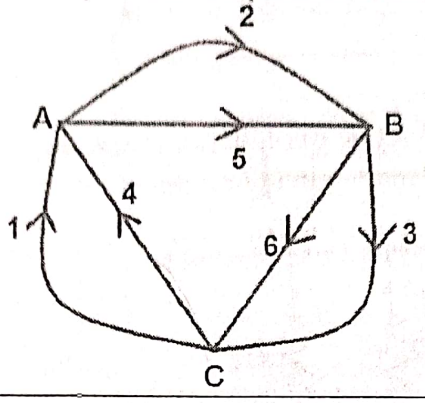
NETWORK THEORY (19APC0401)

(Electronics & Communication Engineering)

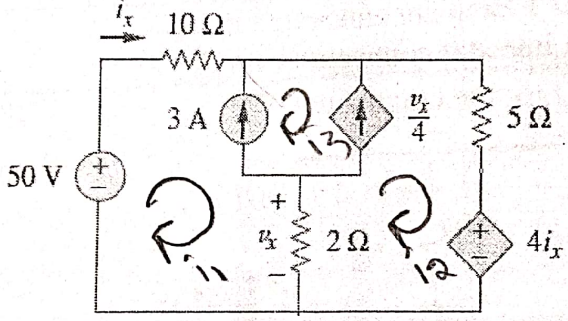
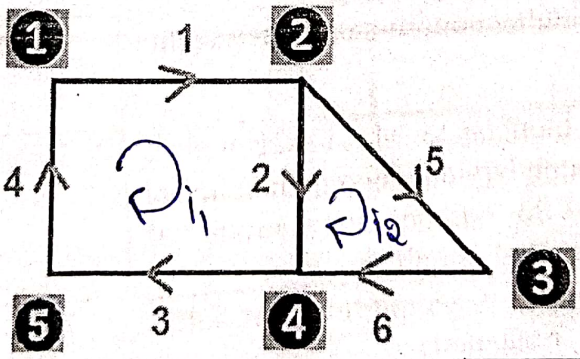
Time: 3 Hours | Max Marks: 70

PART-A (10*2= 20 M)

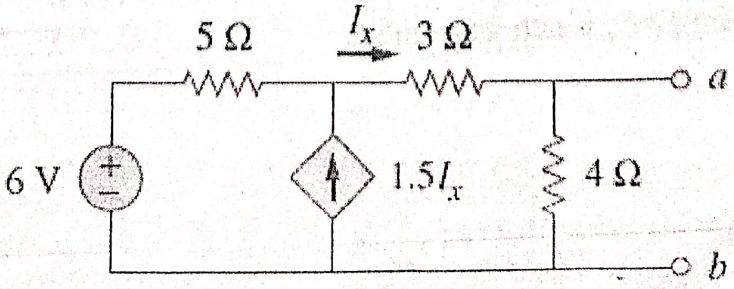
		Answer the following	UNIT	Marks
1	a)	If Req = 50 Ω in the circuit shown, find R. 	I	2
	b)	Mention the properties of a tree w.r.t Network topology.	I	2
	c)	What is Thevenin's resistance in the circuit shown? 	II	2
	d)	Three capacitors of 3 F each are connected in delta. Convert it into star connection.	II	2
	e)	What is the value of $i(0^+)$ for the circuit shown? 	III	2
	f)	What is important role of initial conditions, in the transient analysis of RLC circuits?	III	2
	g)	A primary coil has an inductance of 100μH which is connected in series with secondary coil having inductance of 240μH. Total inductance of this combination is measured as 150μH. Determine coefficient of coupling.	IV	2
	h)	Prove that resonant frequency is geometric mean of half power frequencies.	IV	2
	i)	Mention the condition of symmetry and reciprocity for Z parameters.	V	2
	j)	Mention the classification of network functions	V	2

2	a)	Find Node voltages for the given circuit 	5 M
	b)	Find cut-set schedule. Obtain equilibrium equations based on Node voltages. 	5 M

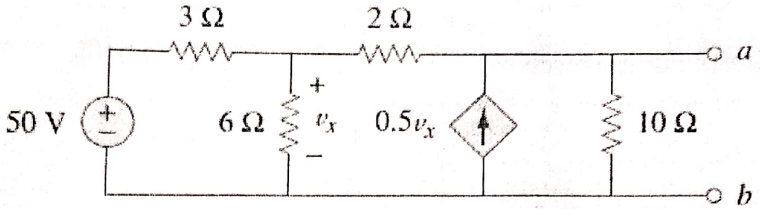
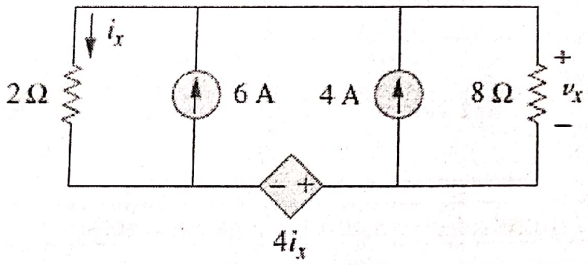
(OR)

3	a)	Find ix and vx using Mesh analysis for the given circuit 	5 M
	b)	Find tie-set schedule. Obtain equilibrium equations based on mesh equations. 	5 M

UNIT-II

4	a)	Find Thevenin's equivalent circuit between terminals a-b 	5 M

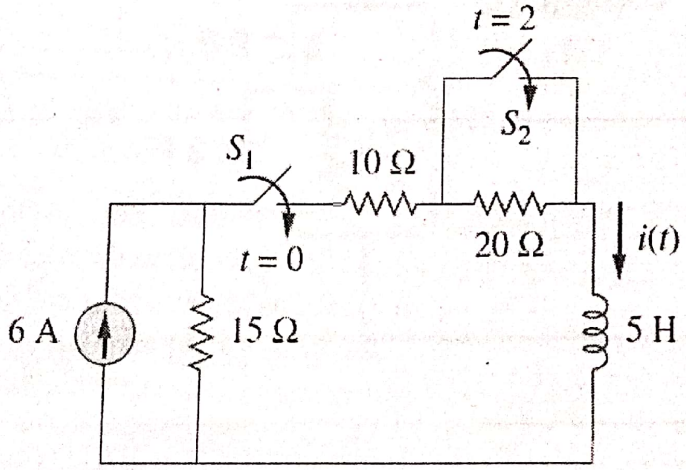
(OR)

5	a)	Find Norton's equivalent circuit between terminals a-b 	5 M
	b)	Find io using Superposition theorem. 	5 M

UNIT-III

6.	Derive the expression for complete response of series RLC circuit for overdamped, critically damped, and underdamped cases.	10 M

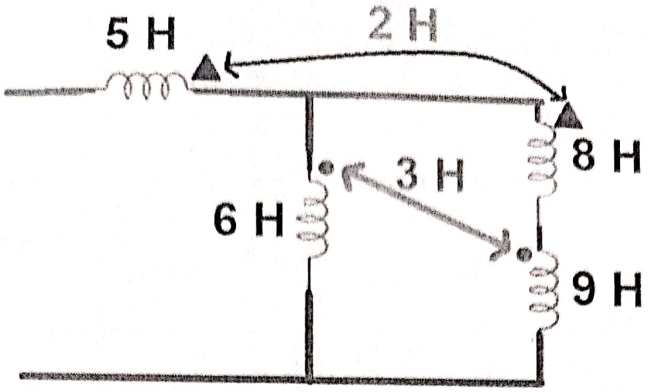
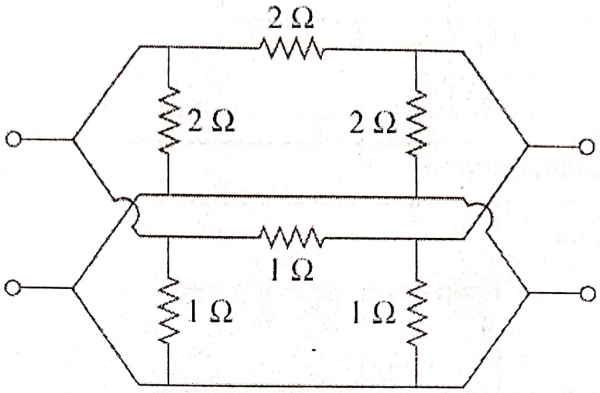
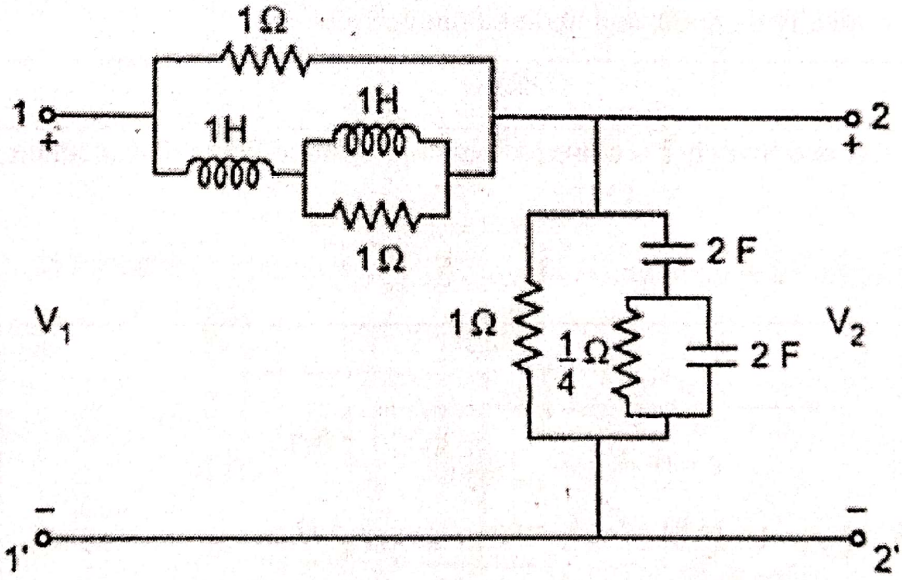
(OR)

7.	At t=0, Switch-1 is closed, and Switch-2 is closed 2 secs later. Find i(t) for t>0. Calculate i(1) and i(3). 	10 M

UNIT-IV

8	a)	Find RMS value of the following equations (i) $V(t) = 2+3\cos(100t) + 4\cos(100t - 120°)$ V (ii) $i(t) = 4 + 6\cos(25t) + 5\sin(30t)$ A (iii) $v(t) = 6\cos(25t) + 5\cos^2(25t)$ V	6 M
	b)	Derive the expression for Bandwidth in series resonant circuit	4 M

(OR)

9.		Obtain the electrical equivalent of the following magnetically coupled circuit. Also find its equivalent inductance. 	10 M
		UNIT-V	
10	a)	Find h parameters for the given circuit 	5 M
	b)	Derive the reciprocal and symmetric condition for Z parameters.	5 M
		(OR)	
11.		Find the network functions Z11 and G12 for the circuit shown. 	10 M