U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

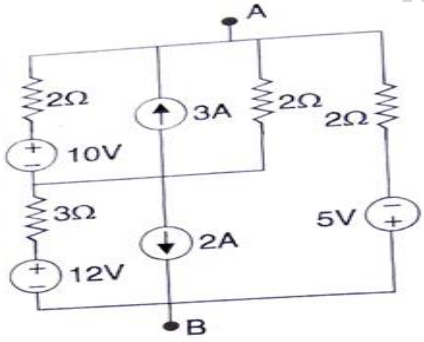
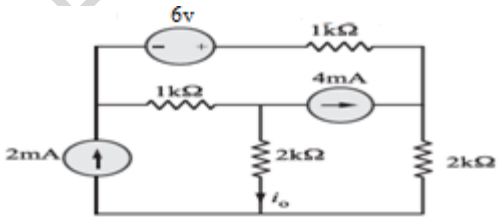
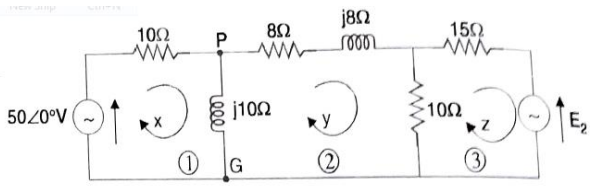
Autonomous Institute Affiliated to VTU

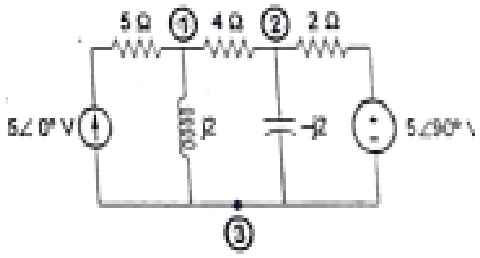
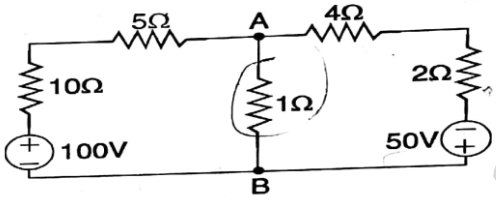
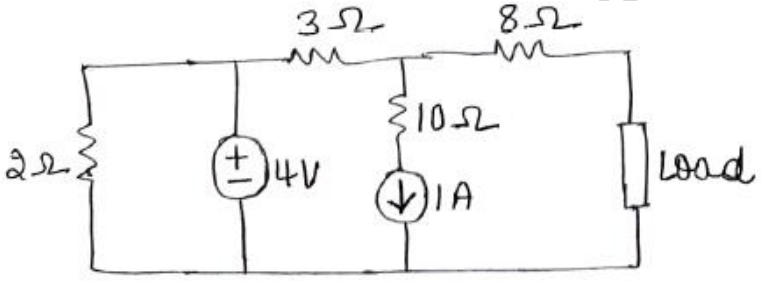
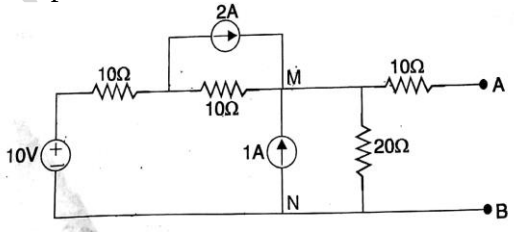
January / February 2025 Semester End Main Examinations

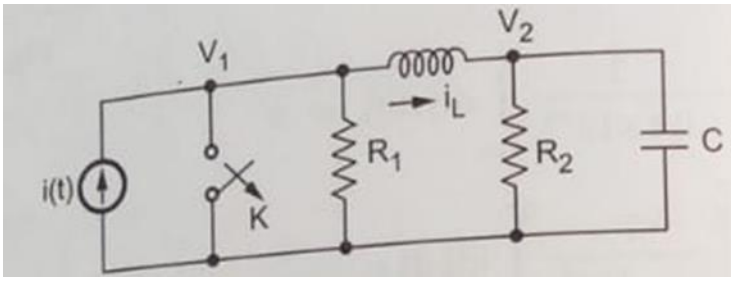
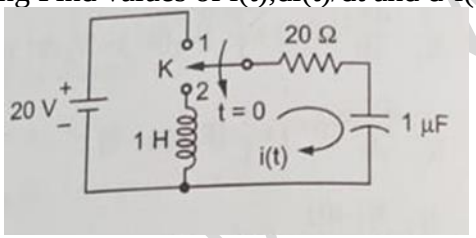
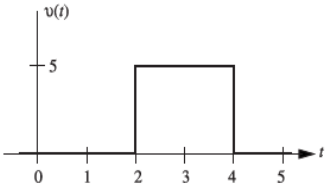
Programme: B.E. **Semester: III**
Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**
Course Code: 22EE3PCECT **Max Marks: 100**
Course: Electrical Circuit Theory

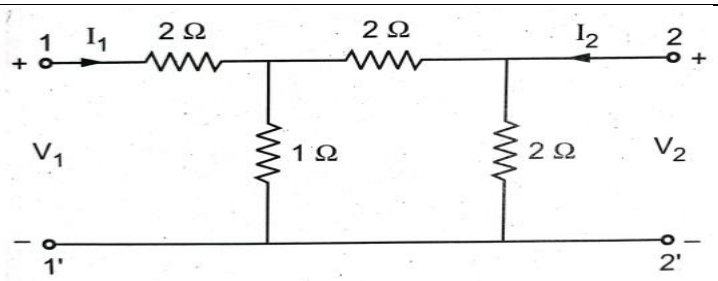
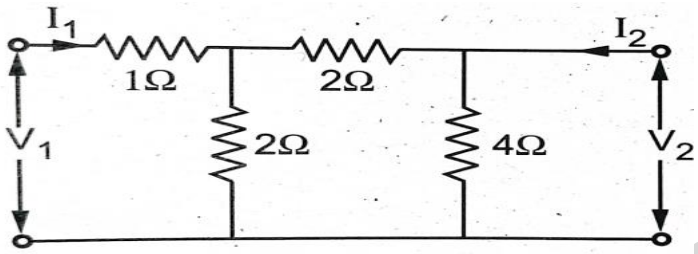
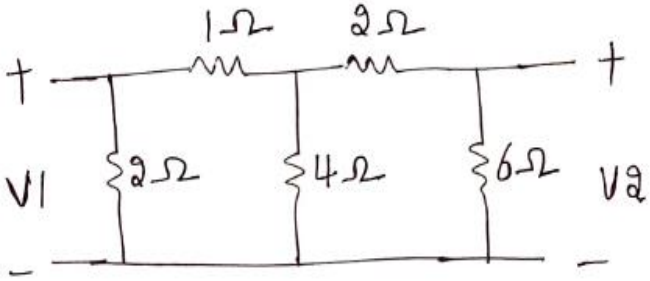
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1.	a)	Reduce the network shown in figure to single voltage source in series with a resistance between the terminals A and B. 	CO2	PO2	08
	b)	Apply super-mesh analysis, determine current "i_0" for the network shown in figure below 	CO2	PO2	06
	c)	Derive an expression for Delta to star converter.	CO1	PO1	06
		OR			
2.	a)	In the circuit shown, determine the value of 'E_2' by mesh analysis. Such that the current through the (8+ j8) Ω impedance is zero. 	CO2	PO2	10

		b)	In the network shown in Figure, determine node voltage by nodal analysis method. 	*CO2*	*PO2*	**10**
			UNIT - II			
	3.	a)	Determine the current through branch 'AB' in the network shown in the figure using superposition theorem. 	*CO2*	*PO2*	**10**
		b)	Determine Norton's equivalent circuit as shown in Fig Q3(b)  Fig Q3(b)	*CO2*	*PO2*	**10**
			OR			
	4.	a)	State and explain Thevenin's theorem.	*CO2*	*PO2*	**10**
		b)	Find the Thevenin's equivalent circuit at the terminals A, B for the network shown in figure and hence determine the power dissipated in a 5-ohm resistor connected between A and B. 	*CO2*	*PO2*	**10**
			UNIT - III			
	5.	a)	Derive the expression for resonant frequency in terms half power frequencies	*CO2*	*PO2*	**10**
		b)	In a series circuit R = 6 Ω, ω0 = 4.1 × 10^6 rad/sec, band width = 10^5 rad/sec. Compute L, C, half power frequencies and Q.	*CO2*	*PO2*	**10**

			OR			
	6	a)	The network shown in figure has two independent node pairs of the switch K is opened at t=0, find the following quantities at t=0 i)V_1 ii) V_2 iii) dV_1/dt iii) dV_2/dt. 	*CO2*	*P02*	**10**
		b)	In the circuit as shown in the fig the switch K is changed from position 1 to 2 at t=0. The steady state having been reached before switching Find values of i(t),di(t)/dt and $d^2i(t)/d(t^2)$ at=0+ 	*CO2*	*P02*	**10**
			UNIT - IV			
	7.	a)	State and prove initial value and final value theorem.	*CO3*	*P02*	**10**
		b)	Express the voltage pulse shown in Fig. in terms of unit step function and then find V(s) also determine L{dv(t)/d(t)} 	*CO3*	*P02*	**10**
			OR			
	8.	a)	Obtain the Laplace transform of (i)Unit step function (ii)Impulse function (iii)Sinusoidal function	*CO3*	*PO2*	**10**
		b)	State and prove initial and final value theorem.	*CO3*	*PO2*	**10**
			UNIT - V			
	9.	a)	Determine the Z-parameters for the circuit shown in the Fig.	*CO4*	*P03*	**10**

						
		b)	Obtain the h-parameters of the network shown in Fig. Give its equivalent circuit. 	*CO4*	*P03*	**10**
			OR			
	10.	a)	Obtain the Z-parameters in terms of Y-parameters.	*CO4*	*PO3*	**10**
		b)	Find Z and h-parameters given in Fig. 	*CO4*	*PO3*	**10**

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