U.S.N.										

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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

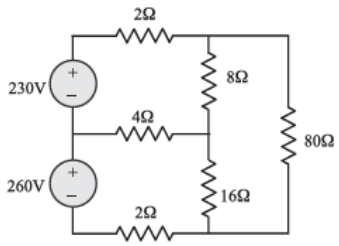
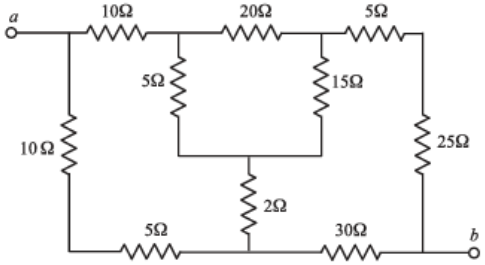
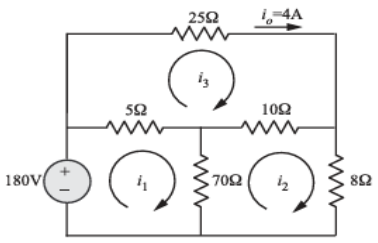
Programme: B.E. **Semester: III**

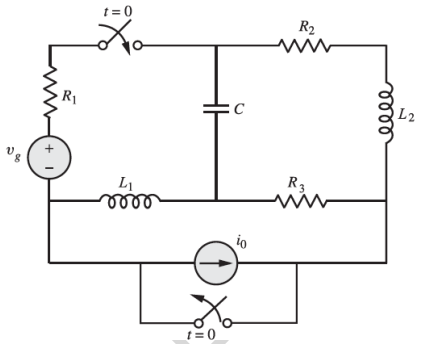
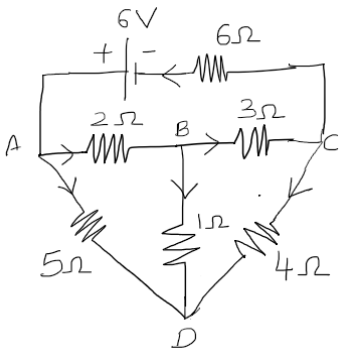
Branch: ES Cluster (EEE/ET/ECE/EIE/MD) **Duration: 3 hrs.**

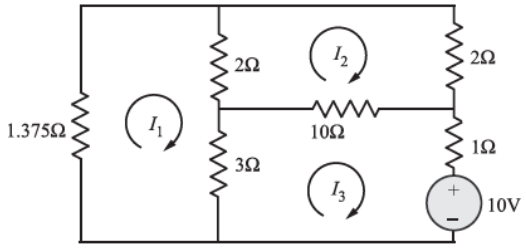
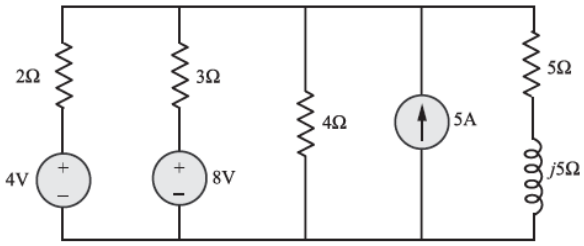
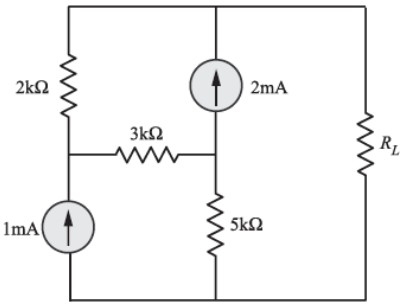
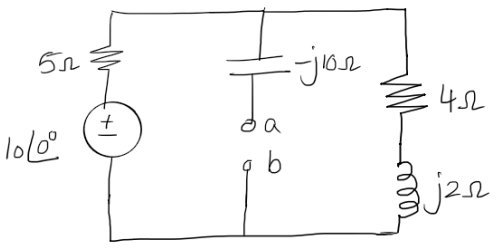
Course Code: 22ES3PCECA **Max Marks: 100**

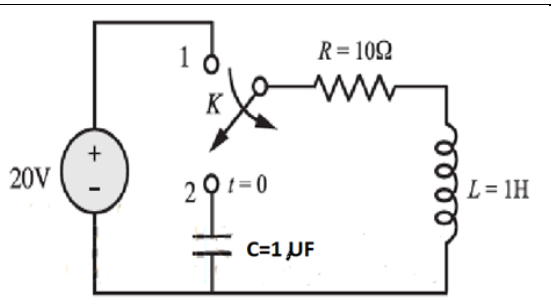
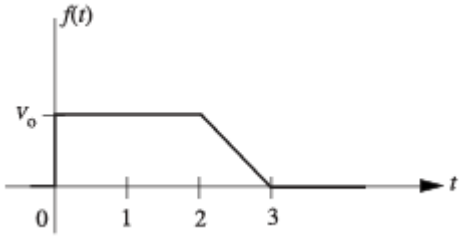
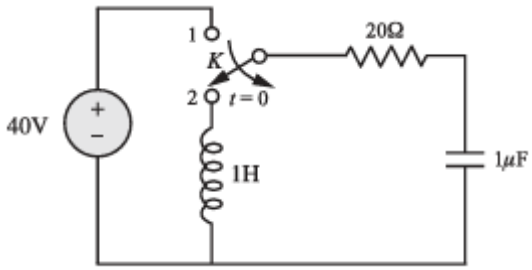
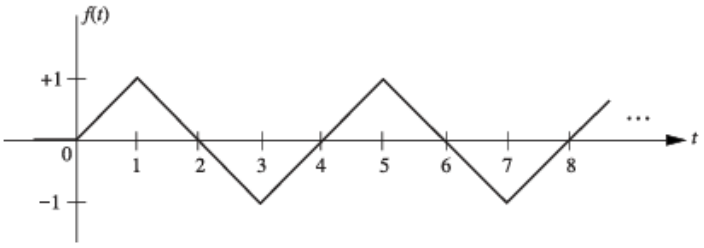
Course: Electrical Circuit Analysis

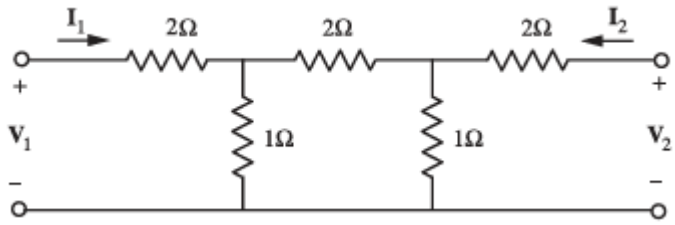
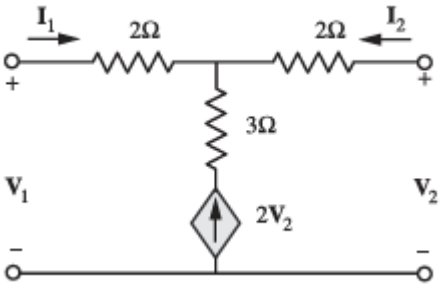
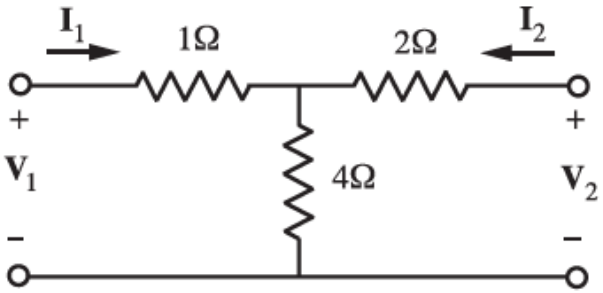
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1	a)	Find the power dissipated in 80 Ω resistor using mesh analysis shown in figure 1a  figure 1a	2	1	**10**
	b)	Determine the resistance between the terminals a-b of the network shown in Figure 1b  Figure 1b	2	1	**10**
		OR			
2	a)	Find the power dissipated in the 70 Ω resistor for the circuit shown in Figure 2a.  Figure 2a	2	1	**10**

		b)	Derive an expression to convert i. Star to Delta resistance ii. Delta to star resistance	*1*	-	**10**
			UNIT - II			
	3	a)	With an example explain the following terms i. Mesh ii. Oriented graph iii. Planar graph iv. Tree v. Link vi. Node vii. Co-tree	*1*	-	**10**
		b)	A series RLC Circuit has a resistance of 10k ohm, Inductance of 2mH and capacitance of 10uF. Find the Q factor, resonant frequency and Bandwidth.	*2*	*1*	**10**
			OR			
	4	a)	Draw the dual of the circuit shown in Figure 4a.  Figure 4a	*2*	*1*	**10**
		b)	In the following network, the numerical values of resistances also indicate the branch numbers. Write the oriented graph of the network. Write incidence matrix, tie set schedule and cut set schedule for figure 4b.  Figure 4b	*2*	*1*	**10**
			UNIT - III			
	5	a)	Verify reciprocity theorem for figure 5a by finding the current through 3 Ω resistor	*2*	*1*	**10**

			 Figure 5a			
	b)	Using Millman's theorem to find the current through 5+5j ohm impedance for the circuit shown in figure 5b.  Figure 5b	*2*	*1*	**10**
		OR			
6	a)	Find RL for maximum power transfer and the maximum power that can be transferred in the network shown in Figure 6a  Figure 6a	*2*	*1*	**10**
	b)	Replace the network at terminals a-b with Thevinin's equivalent and Norton's equivalent circuits for the circuit shown in figure 6b.  Figure 6b.	*2*	*1*	**10**
		UNIT - IV			
7	a)	Analyze the given circuit shown in figure 7a. The switch 'K' is moved from '1' to '2' at t=0. Find the values of i, di/dt, d^2i/dt^2 at t=0+. Assume steady state is achieved when K is at '1'	*3*	*2*	**10**

			 Figure 7a.			
		b)	Find the Laplace transform of the wave forms shown in Figure 7b  Figure 7b	*3*	*2*	**10**
			OR			
	8	a)	Analyze the given circuit shown in figure 8a. The switch 'K' is moved from '1' to '2' at t=0. Find the values of i ,di/dt ,d^2i/dt^2 at t=0+. Assume steady state is achieved when K is at '1'  figure 8a	*3*	*2*	**10**
		b)	Find the Laplace transform of the periodic wave forms shown in Figure 8b  Figure 8b	*3*	*2*	**10**
			UNIT - V			
	9	a)	Determine the [h] parameters of the two port network shown in figure 9a	*2*	*1*	**10**

			 Figure 9a			
		b)	Explain Hybrid parameters and Admittance parameters. Derive [h] parameters in terms of [Y] parameters	*2*	*1*	**10**
			OR			
	10	a)	Determine the [Y] parameters of the two port network shown in figure 10b  Figure 10a	*2*	*1*	**10**
		b)	Apply the knowledge of two port for the network shown in Figure10b and show that **AD - BC** = 1  Figure10b	*2*	*1*	**10**

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