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

Autonomous Institute Affiliated to VTU

April 2024 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

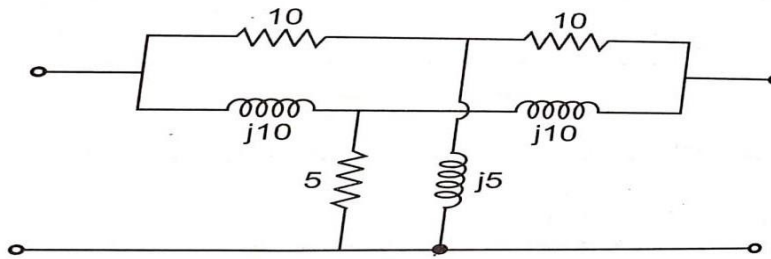**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
                        2. Missing data, if any, may be suitably assumed.

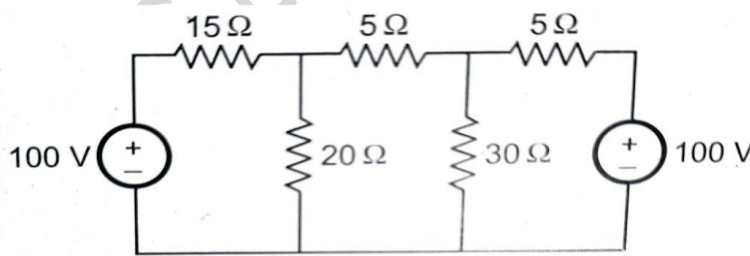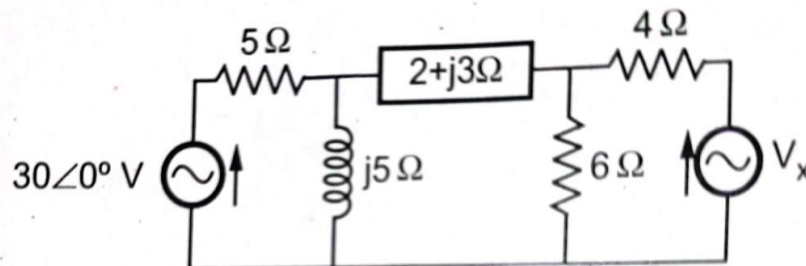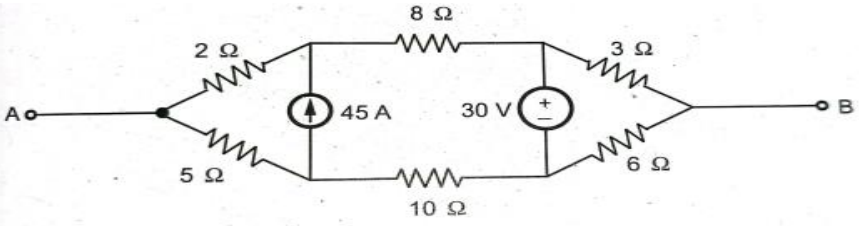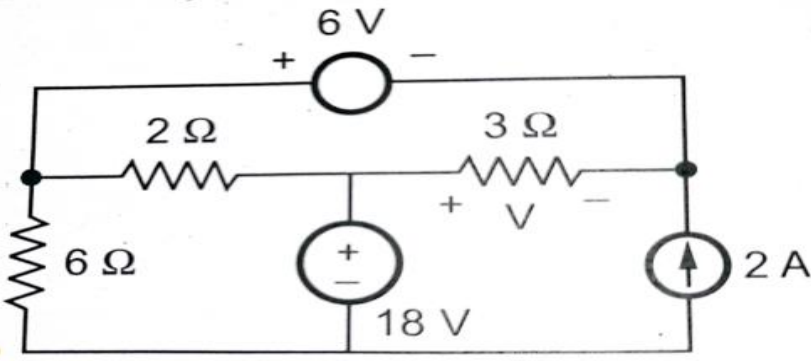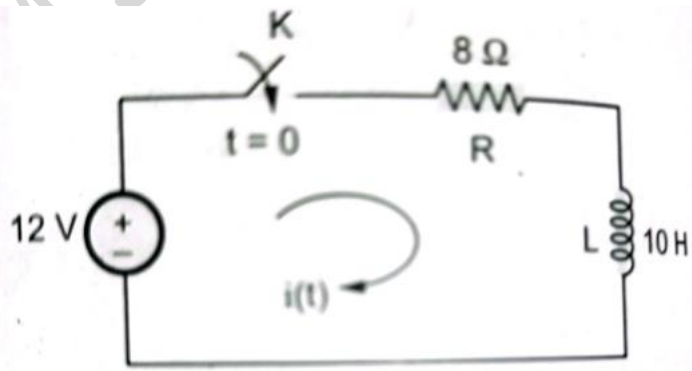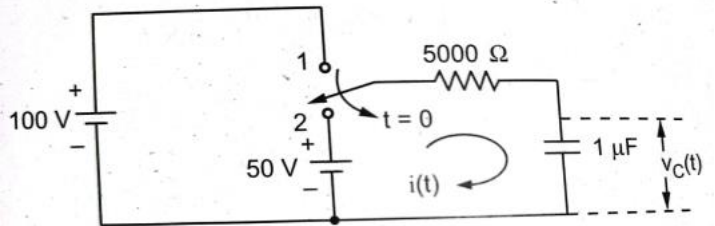|			UNIT - I	CO	PO	Marks
1	a)	For the network shown in the Figure Consists of two star connected circuits in parallel. Obtain the single delta connected equivalent.	CO1	PO2	**10**
	b)	Write the mesh equation for the circuit shown in Figure and determine mesh currents using mesh analysis.	CO1	PO1	**10**
			OR			
2	a)	Use the nodal analysis to calculate the value of V_x in the circuit shown in the Fig. such that the current through $(2+j3)$ Ω impedance is zero.	CO1	PO2	**10**
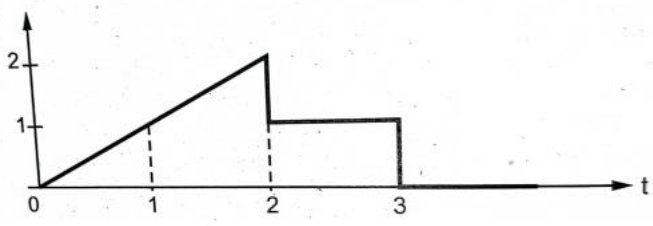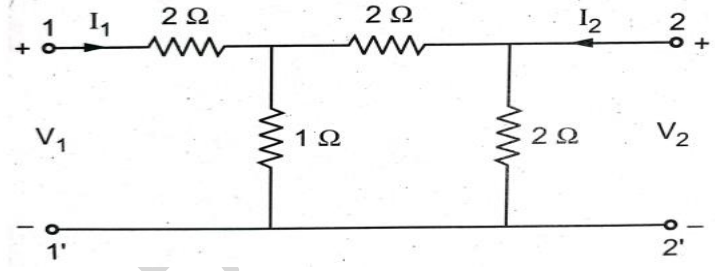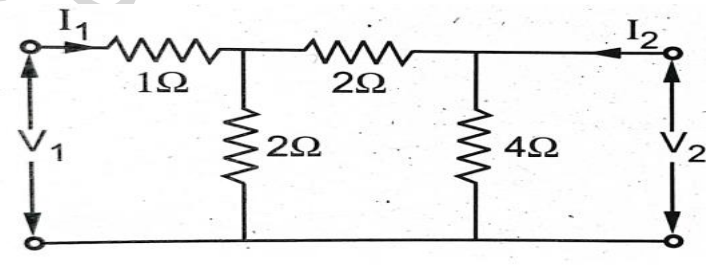
				CO1	PO1	10
	b)	Reduce the network shown in the Fig. to a single voltage source in series with a resistance using source shifing and source transformations.				
		UNIT - II				
3	a)	State and prove Norton's Theorem.		CO2	PO2	10
	b)	Determine the voltage 'V' across 3 Ω resistor using Superposition Theorem for the circuit given in the Figure.		CO2	PO2	10
		UNIT - III				
4	a)	A series RLC circuit consists of R =10 Ω, L=0.01 H, and C =0.01µF, is connected across a supply of 10 mV. Determine, i)f_0 ii) Q-factor iii) BW iv) f_1 and f_2 v) I_0		CO3	PO2	10
	b)	In the circuit shown in the Fig. initially switch is kept open for long time. At t = 0, Switch K is closed. Obtain expression for current in the circuit for t >0. Find the value of current at t= 0.25 sec. what will be the current in circuit in one time constant period? Determine the instant of time at which the current in the circuit reaches to 1.2 A		CO3	PO2	10
		OR				
5	a)	What is significance of initial conditions? Write a note on initial conditions in basic circuit elements.		CO3	PO2	10

	b)	The switch is moved from position 1 to 2 at t=0. Obtain the voltages $V_R(t)$ and $V_c(t)$ for t $\geq$ 0	CO3	PO2	**10**
		UNIT - IV			
6	a)	Determine the Laplace transform of,	CO4	PO2	**08**
	b)	Explain Laplace transform of unit Step and Unit Ramp functions.	CO4	PO2	**05**
	c)	State and explain Initial value and Final value theorem.	CO4	PO2	**07**
		UNIT - V			
7	a)	Determine the z-parameters for the circuit shown in the Fig.	CO5	PO5	**10**
	b)	Obtain the h-parameters of the network shown in Fig. Give its equivalent circuit.	CO5	PO5	**10**

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