PVP 20

Code: 20EC3304

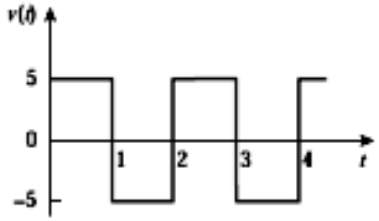
II B.Tech - I Semester –Regular / Supplementary Examinations
DECEMBER 2023

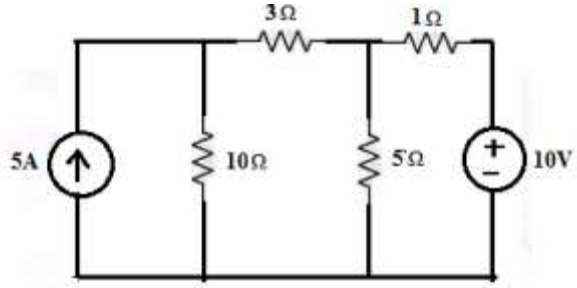
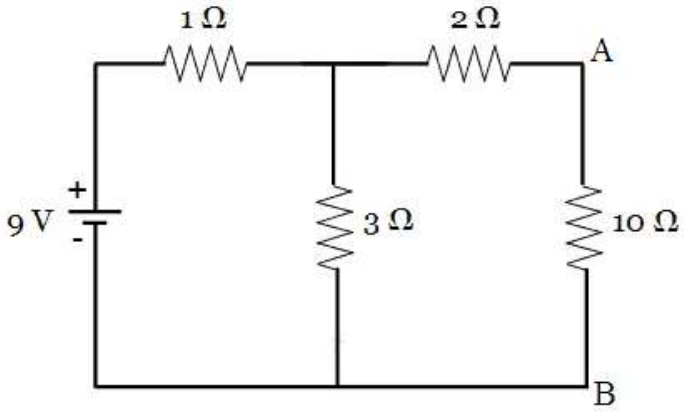
NETWORK THEORY AND ANALYSIS
(ELECTRONICS & COMMUNICATION ENGINEERING)

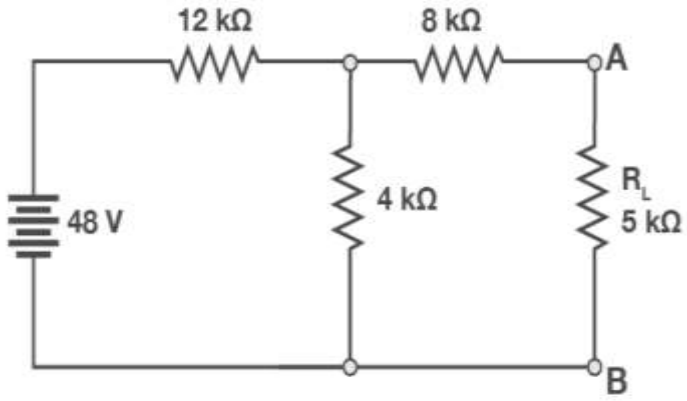
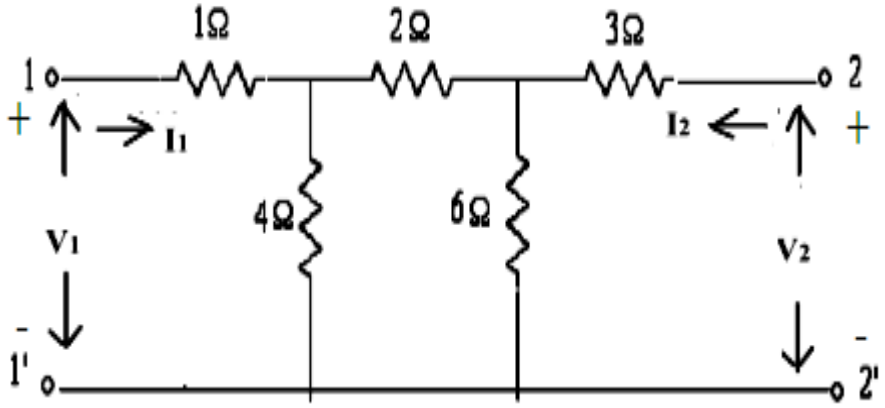
Duration: 3 hours Max. Marks: 70

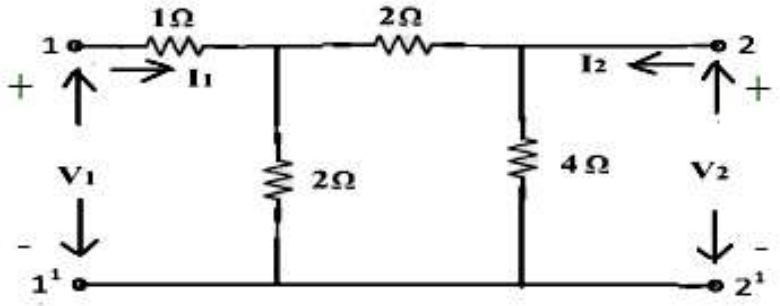
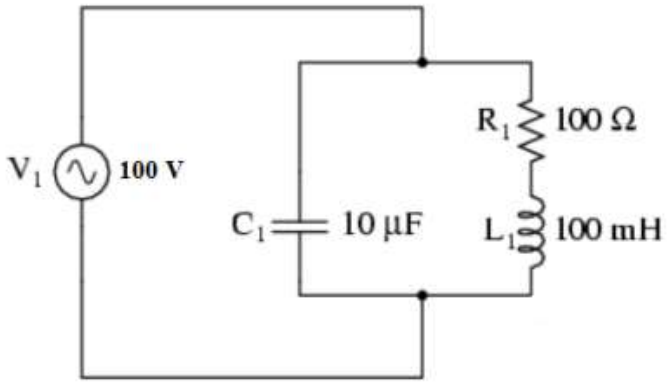
Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
		UNIT-I			
1	a)	Calculate the RMS value of the voltage waveform shown below. 	L2	CO1	7 M
	b)	Compare phasor relationships for R, L and C circuit components.	L2	CO1	7 M
		OR			
2	a)	Explain the concept of phasors with suitable example.	L2	CO1	7 M
	b)	Define power factor. Why power factor is important in circuits?	L2	CO1	7 M
		UNIT-II			
3	a)	Derive the transient response of series RC-circuit with DC excitation.	L3	CO2	7 M

	b)	A series RL circuit with R=30Ω and L= 15H has a constant voltage V=60 volts applied at t=0. Determine the current in the circuit, voltage across resistor and voltage across inductor.	L3	CO2	7 M
		OR			
4	a)	Derive the transient response of series RL circuit with DC excitation.	L3	CO2	7 M
	b)	Write a short note on transient analysis of a circuit.	L2	CO2	7 M
		UNIT-III			
5	a)	Determine the current in 10Ω resistor for the following network by using nodal analysis. 	L4	CO3	7 M
	b)	State and prove superposition theorem.	L2	CO3	7 M
		OR			
6	a)	For the given circuit, determine the current flowing through 10 Ω resistor using Norton's theorem. 	L4	CO3	7 M

	b)	Find $\boldsymbol{V_{TH}}$, $\boldsymbol{R_{TH}}$ and the load current $\boldsymbol{I_L}$ flowing through and load voltage V_L across the load resistor in the circuit below using Thevenin's Theorem. 	L4	CO3	7 M
		UNIT-IV			
7	a)	Derive the relation between ABCD and Z-parameters.	L3	CO2	7 M
	b)	The Z-parameters of a two-port network are Z_{11}= 10Ω, Z_{22}= 15Ω, Z_{12}= 5Ω and Z_{21}= 5Ω. Find ABCD parameters.	L2	CO1	7 M
		OR			
8	a)	Obtain Z – parameters for the network shown below. 	L4	CO3	7 M

	b)	Determine the y-parameters of the following network. 	L4	CO3	7 M
UNIT-V					
9	a)	Explain about parallel resonance with phasor diagrams.	L2	CO4	7 M
	b)	In a parallel resonant circuit shown in figure, find the resonant frequency, bandwidth, Q-factor and current at resonance. 	L4	CO4	7 M
OR					
10	a)	Obtain the expression for resonant frequency, bandwidth and Q-factor for series R-L-C circuit.	L3	CO4	7 M
	b)	Compare series resonance and parallel resonance.	L4	CO4	7 M