PVP 20

Code: 20EC3304

II B.Tech - I Semester –Regular / Supplementary Examinations
DECEMBER 2022

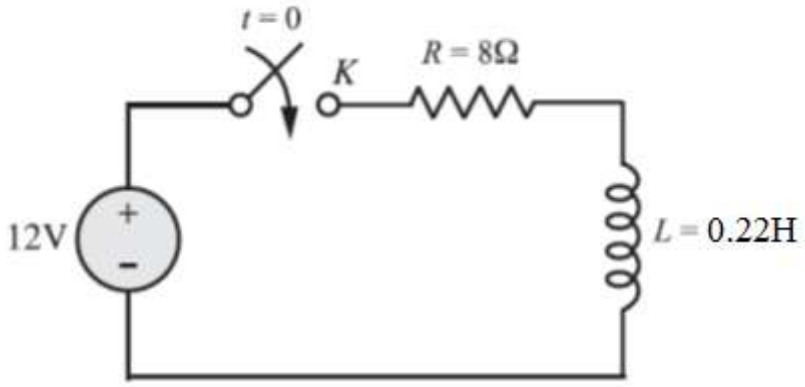
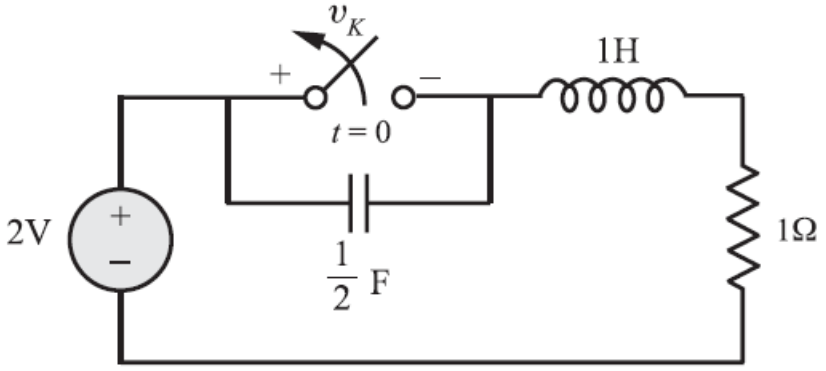
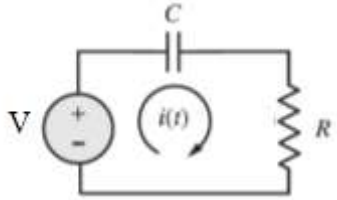
NETWORK THEORY AND ANALYSIS
(ELECTRONICS & COMMUNICATION ENGINEERING)

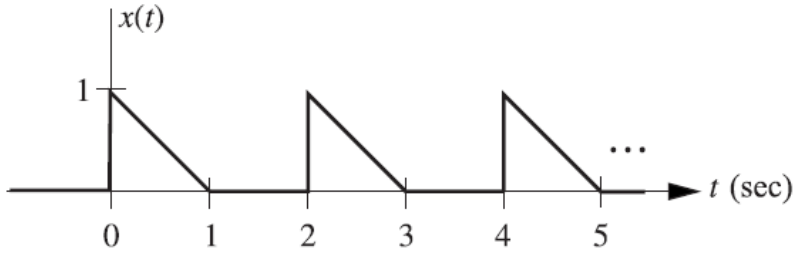
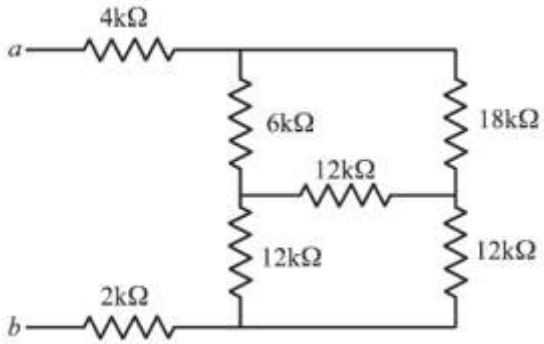
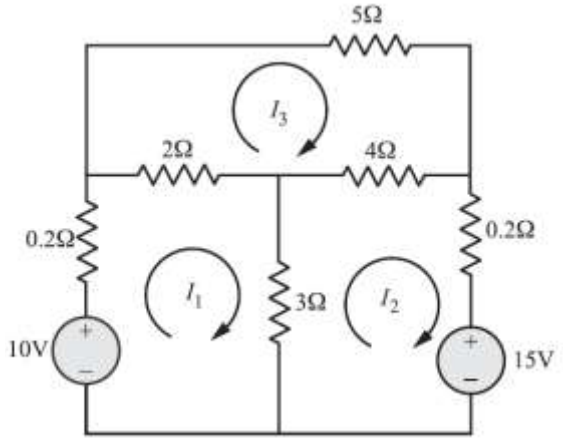
Duration: 3 hours Max. Marks: 70

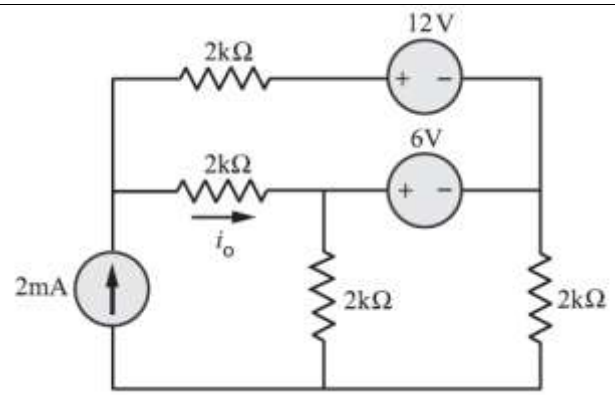
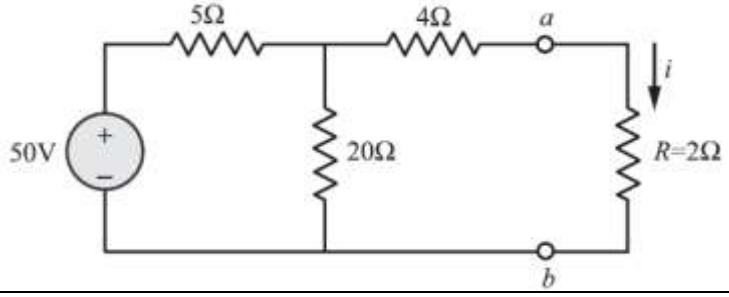
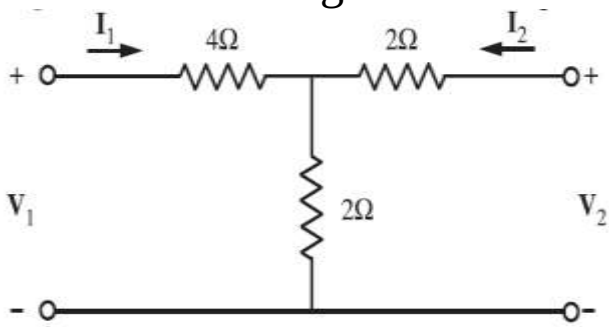
Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

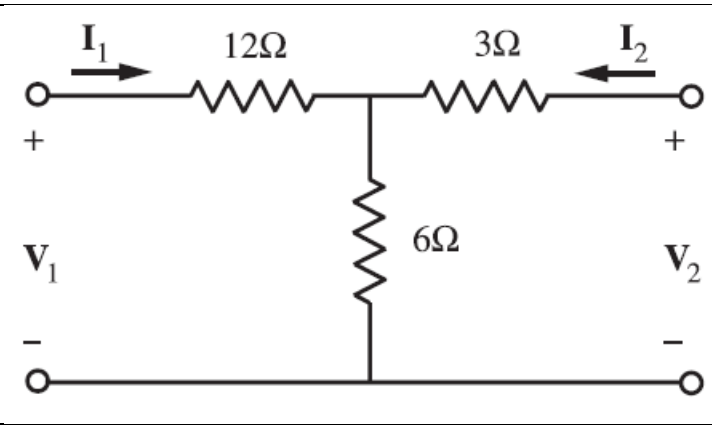
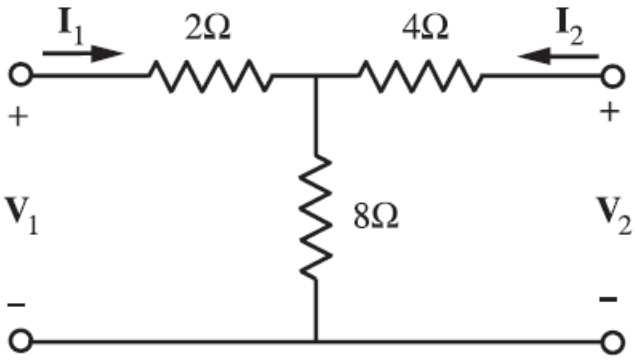
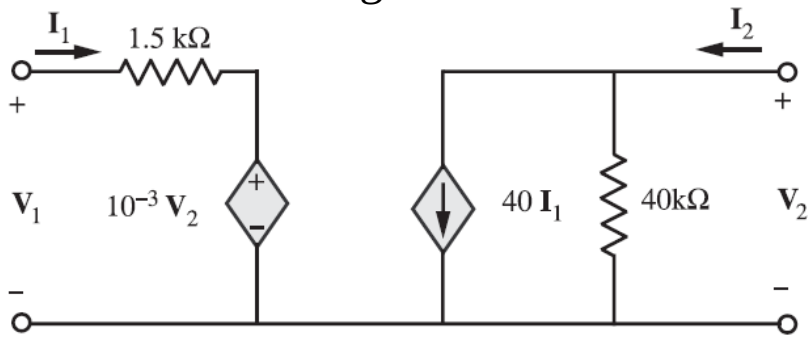
BL – Blooms Level CO – Course Outcome

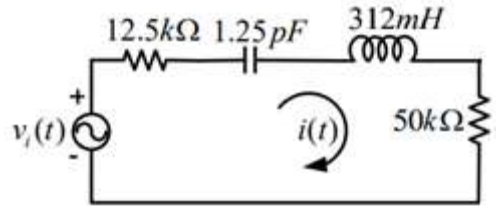
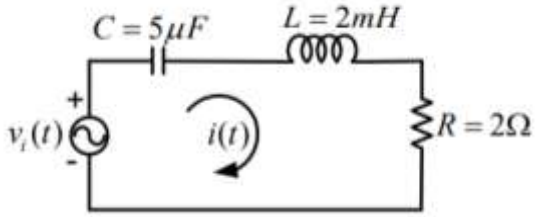
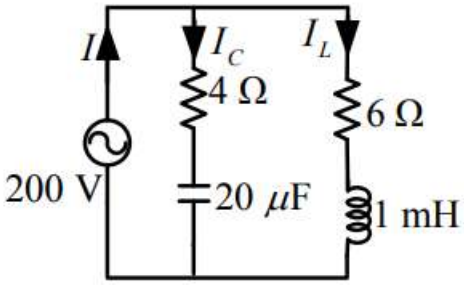
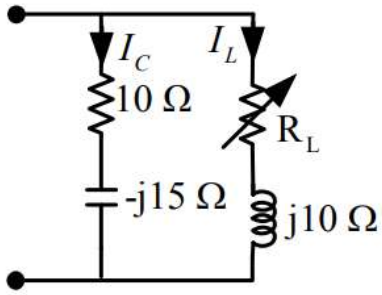
			BL	CO	Max. Marks
UNIT-I					
1	a)	Analyze a series RLC excited by sinusoidal voltage to obtain the phase relation between applied voltage and current.	L4	CO3	6 M
	b)	The voltage and a current in a circuit are given $v=150\angle 30^{o}V$, $I=2\angle -15^{o}A$. If the circuits works at 50Hz supply, solve for impedance, resistance, reactance, power factor and power consumed.	L3	CO2	8 M
OR					
2	a)	Explain the following: (i) Average Voltage (ii) Power factor (iii) Form factor (iv) Apparent power (v) Reactive power (vi) Power triangle	L2	CO1	6 M
	b)	A sine wave generator supplies a 500 Hz, 10 V_{rms} to a 2kΩ resistor in series with a 0.1μF capacitor. Solve for parameters, the total impedance Z, current I, phase angle θ,	L3	CO3	8 M

		capacitive voltage V_c and resistive voltage V_R .			
		UNIT-II			
3	a)	In the given network, k is closed at t = 0 with zero current in the inductor. Find the values of i, $\frac{di}{dt}, \frac{d^2i}{dt^2}$ at $t=0^+$ if R=8Ω, and L= 0.22H.  	L3	CO2	7 M
	b)	The circuit shown in Fig. is in steady state with switch K closed. At t=0, the switch is opened. Determine the voltage across the switch, v_k, $\frac{dv_k}{dt}$, at $t= 0^+$.  	L3	CO2	7 M
		OR			
4	a)	Consider the RC circuit shown in Fig . Find i(t) by assuming circuit is initially relaxed.  	L4	CO4	7 M

	b)	Find the Laplace transform of the periodic signal x(t) shown in Fig. 	L4	CO4	7 M
		UNIT-III			
5	a)	Find the value of resistance between the terminals a-b of the network shown in Fig. 	L3	CO2	7 M
	b)	For the electrical network shown in Fig., determine the loop currents and all branch currents. 	L3	CO2	7 M
		OR			
6	a)	Use superposition to find i_0 in the circuit shown in Fig.	L4	CO3	7 M

					
	b)	Using the Thevenin's theorem, find the current i through R= 2Ω. 	L3	CO2	7 M
		UNIT-IV			
7	a)	Determine the admittance parameters of the T network shown in Fig. 	L4	CO3	7 M
	b)	Find the z parameters of the circuit shown in the fig. Then compute the current in a 4Ω load if a $24\angle 0^\circ$ V source is connected at the input port.	L4	CO3	7 M

					
		OR			
8	a)	Find the hybrid parameters for the two-port network shown in Fig. 	L4	CO3	7 M
	b)	Find the transmission parameters for the network shown in Fig. 	L4	CO3	7 M
		UNIT-V			
9	a)	For the circuit shown in figure find the following (i) The resonant frequency f_o (ii) Quality factor Q (iii) f_{c1}, f_{c2} (iv) Bandwidth B	L4	CO4	7 M

					
	b)	For the circuit shown in figure find the resonant frequency, quality factor and bandwidth for the circuit. Determine the change in Q and the bandwidth if R is changed from R = 2 Ω to R = 0.4 Ω 	L4	CO4	7 M
OR					
10	a)	For the circuit as shown in Fig. find the resonant frequency and the corresponding current in each branch. 	L4	CO4	7 M
	b)	Find the value of R_L for which the circuit as shown in Fig. is resonant. 	L4	CO4	7 M