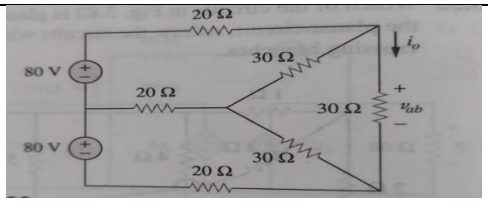
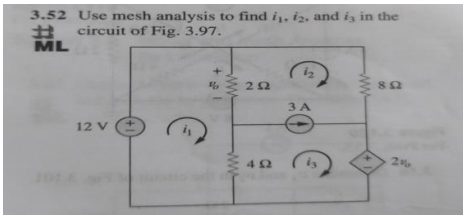
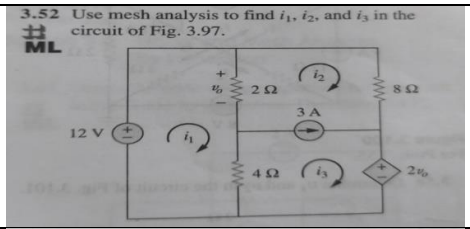
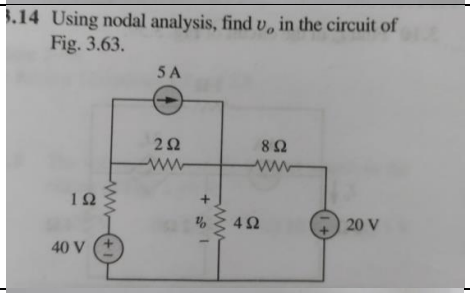
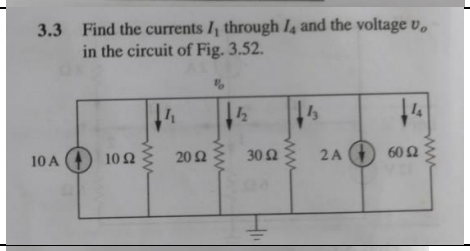
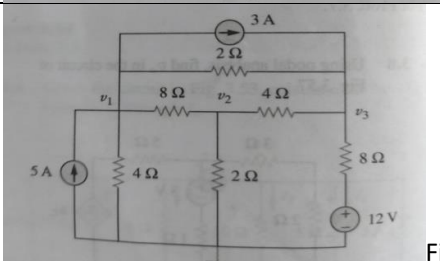
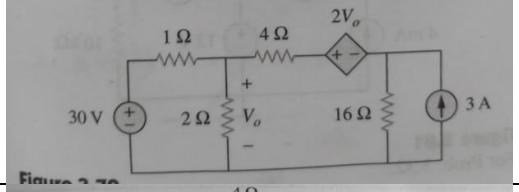
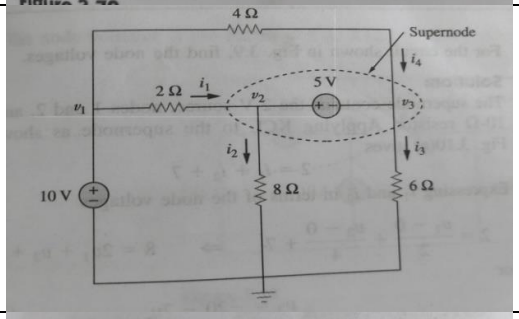
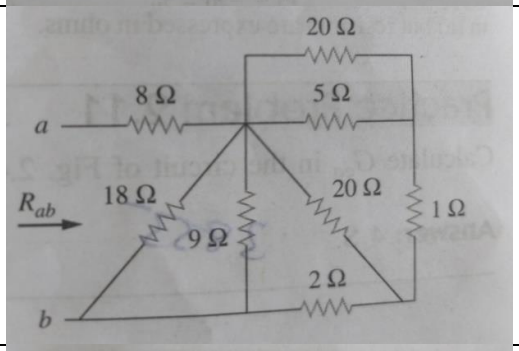
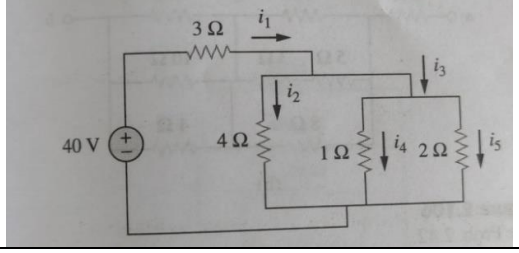
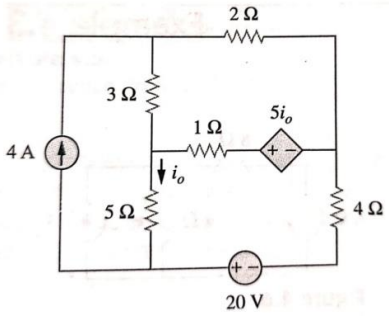
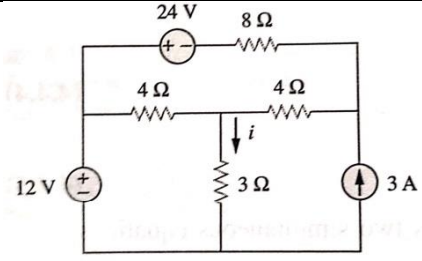
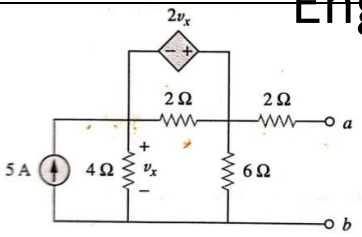
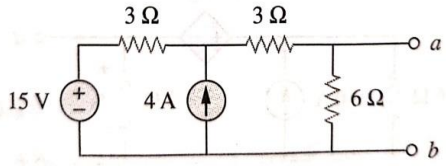
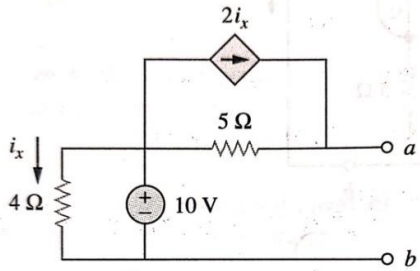
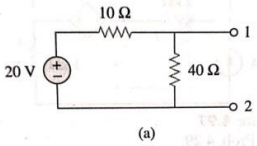
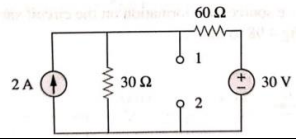
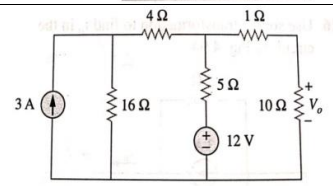
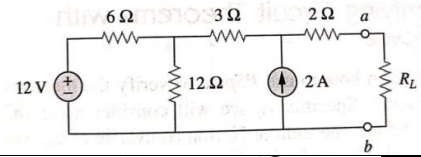
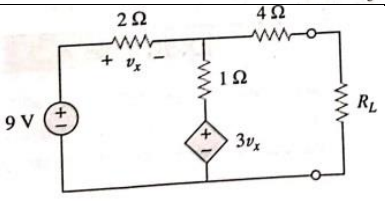
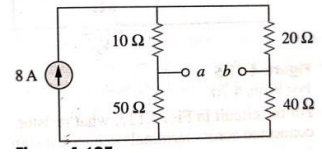
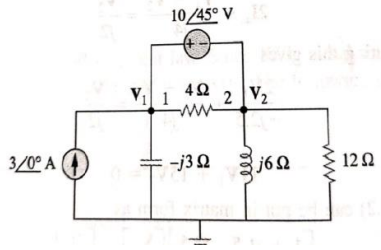
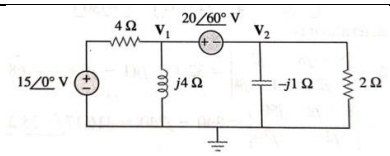
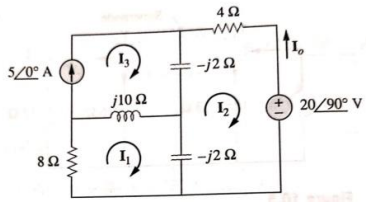
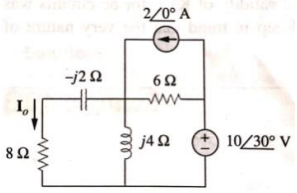
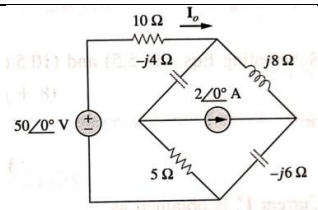
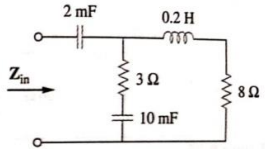
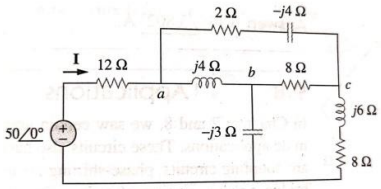
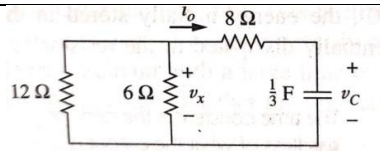
Course Code/Name : EC 3251 Circuit Analysis
Regulation : 2021

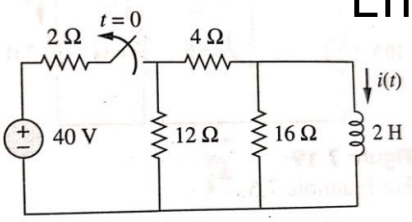
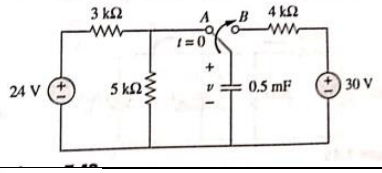
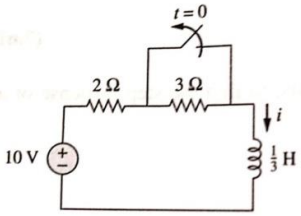
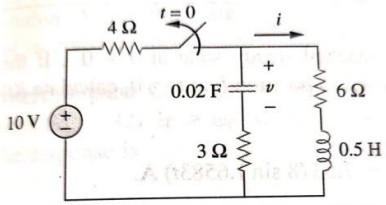
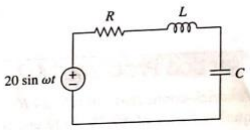
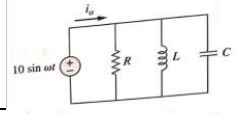
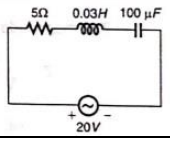
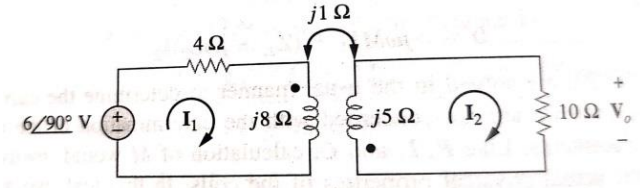
Unit I - V Slot Questions

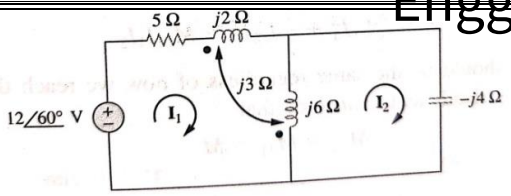
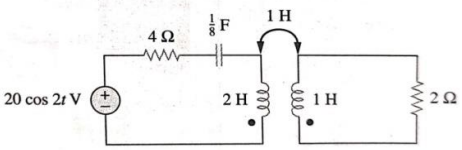
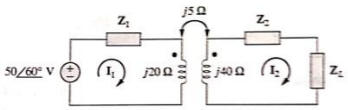
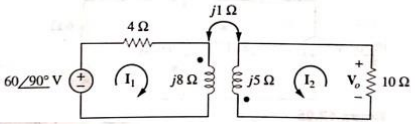
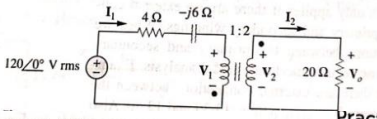
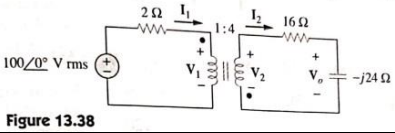
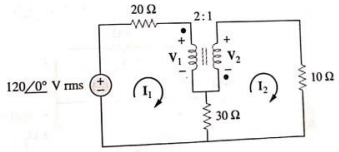
QNo	Unit .No.	Questions	Status	Marks	Sign
1	I	 Find Vab and Io using Mesh		8	
2	I			8	
3	I			8	
4	I			8	
5	I			8	
6	I	 Find V1,V2,V3 uisng Nodal Analysis		8	

7	I	3.23 Use nodal analysis to find V_o in the circuit of Fig. 3.72.  		8	
8	I	 		8	
9	I	 		8	
10	I	2.31 For the circuit in Fig. 2.95, determine i_1 to i_5.  		8	
Unit II Slot Questions					
1	II	 Find Io using Super Position Theorem		8	
2	II	 Find I using Super Position Theorem		8	

3	II	 Draw the thevenins equivalent ckt		8	
4	II	 Draw Nortons Equivalent ckt		8	
5	II	 Draw Nortons Equivalent		8	
6	II	**4.33** Determine R_{Th} and V_{Th} at terminals 1-2 of each of the circuits in Fig. 4.101.  (a) 		8	
7	II	 Draw Thevenins and Nortons ckt		8	
8	II	Find the value of R_L for maximum power transfer in the ci Fig. 4.50. Find the maximum power. 		8	
9	II	 Find RL for Pmax also Pmax		8	
10	II	Determine the Thevenin and Norton equivalents at terminals a-b of the circuit in Fig. 4.125. 		8	

		Unit III			
1	III	 Find V1 and V2 using Nodal Analysis		8	
2	III	 Find V1 and V2 using Nodal Analysis		8	
3	III	 Find i1,i2 and i2 using Mesh Analysis		8	
4	III	 Find Io using Mesh Analysis		8	
5	III	 Find Io using Mesh Analysis		8	
6	III	The voltage across a load is $v(t) = 60\cos(\omega t - 10°)$ V and the current through the element in the direction of the voltage drop is $i(t) = 1.5\cos(\omega t + 50°)$ A. Find: (a) the complex and apparent powers, (b) the real and reactive powers, and (c) the power factor and the load impedance.		8	
7	III	For a load, $\mathbf{V}_{rms} = 110\angle 85°$ V, $\mathbf{I}_{rms} = 0.4\angle 15°$ A. Determine: (a) the complex and apparent powers, (b) the real and reactive powers, and (c) the power factor and the load impedance.		8	
8	III	 Find Zin		8	
9	III	 Find I using star to delta or delta to star		8	
10	III	A series-connected load draws a current $i(t) = 4\cos(100\pi t + 10°)$ A when the applied voltage is $v(t) = 120\cos(100\pi t - 20°)$ V. Find the apparent power and the power factor of the load. Determine the element values that form the series-connected load.		8	
		Unit IV			
1	IV	 find Io , vx, vc (assume vc is fully charged intially		8	

2	IV	 find i(t) at t>0		8	
3	IV	The switch in Fig. 7.43 has been in position *A* for a long time. At $t = 0$, the switch moves to *B*. Determine $v(t)$ for $t > 0$ and calculate its value at $t = 1$ s and 4 s. 		8	
4	IV	 find I(t) for t>0		8	
5	IV	 find i(t) for t>0 (Series RLC)		8	
6	IV	Chapter 8 328 **Example 8.5** In the parallel circuit of Fig. 8.13, find $v(t)$ for $t > 0$, assuming $v(0) = 5$ V, $i(0) = 0$, $L = 1$ H, and $C = 10$ mF. Consider these cases: $R = 1.923\ \Omega$, $R = 5\ \Omega$, and $R = 6.25\ \Omega$.		8	
7	IV	In the circuit of Fig. 14.24, $R = 2\ \Omega$, $L = 1$ mH, and $C = 0.4\ \mu$F. (a) Find the resonant frequency and the half-power frequencies. (b) Calculate the quality factor and bandwidth. (c) Determine the amplitude of the current at ω_0, ω_1, and ω_2. **Solution:** 		8	
8	IV	636 **Example 14.8** In the parallel *RLC* circuit of Fig. 14.27, let $R = 8$ kΩ, $L = 0.2$ mH, and $C = 8\ \mu$F. (a) Calculate ω_0, Q, and B. (b) Find ω_1 and ω_2. (c) Determine the power dissipated at ω_0, ω_1, and ω_2.  **Solution:** (a) 10^5 _ 25 krad/s		8	
9	IV	A series-connected circuit has $R = 4\ \Omega$ and $L = 25$ mH. (a) Calculate the value of C that will produce a quality factor of 50. (b) Find ω_1, ω_2, and B. (c) Determine the average power dissipated at $\omega = \omega_0, \omega_1, \omega_2$. Take $V_m = 100$ V.		8	
		EXAMPLE 3.7 ***(AU Dec'15, 16 Marks)*** For the circuit shown in Fig. 1, determine the frequency at which the circuit resonates. Also find the quality factor, voltage across inductance and voltage across capacitance at resonance. **SOLUTION** 		8	
		Unit V			
1	V	 Find i1 and i2		8	

2	V	 find i1 and i2		8	
3	V	 find i1 and i2		8	
4	V	In the circuit of Fig. 13.24, calculate the input impedance and current $\mathbf{I}_1$. Take $\mathbf{Z}_1 = 60 - j100\ \Omega$, $\mathbf{Z}_2 = 30 + j40\ \Omega$, and $\mathbf{Z}_L = 80 + j60\ \Omega$. 		8	
5	V	Solve for $\mathbf{I}_1$, $\mathbf{I}_2$, and $\mathbf{V}_o$ in Fig. 13.27 (the same circuit as for Practice Prob. 13.1) using the T-equivalent circuit for the linear transformer. 		8	
6	V	An ideal transformer is rated at 2400/120 V, 9.6 kVA, and has 50 turns on the secondary side. Calculate (a) the turns ratio, (b) the number of turns on the primary side, and (c) the current ratings for the primary and secondary windings.		8	
7	V	For the ideal transformer circuit of Fig. 13.37, find: (a) the source current $\mathbf{I}_1$, (b) the output voltage $\mathbf{V}_o$, and (c) the complex power supplied by the source.  Practice Problem 13.8		8	
8	V	In the ideal transformer circuit of Fig. 13.38, find $\mathbf{V}_o$ and the complex power supplied by the source.  Figure 13.38		8	
9	V	Calculate the power supplied to the 10-Ω resistor in the ideal transformer circuit of Fig. 13.39. 		8	
10	V	Cut Set and Tie set Problem		8	

Prepared By **Verified By** **Approved By**