



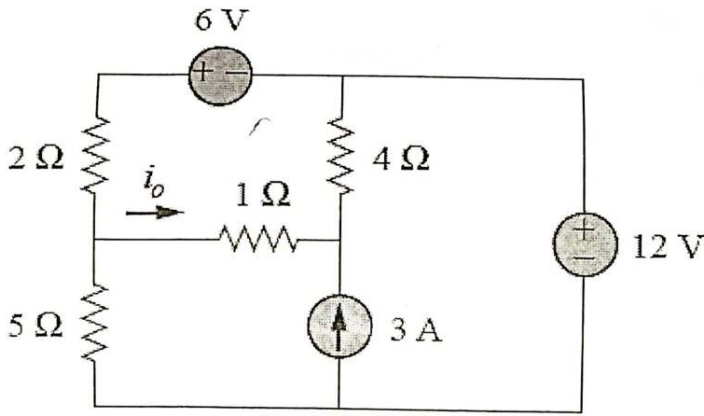
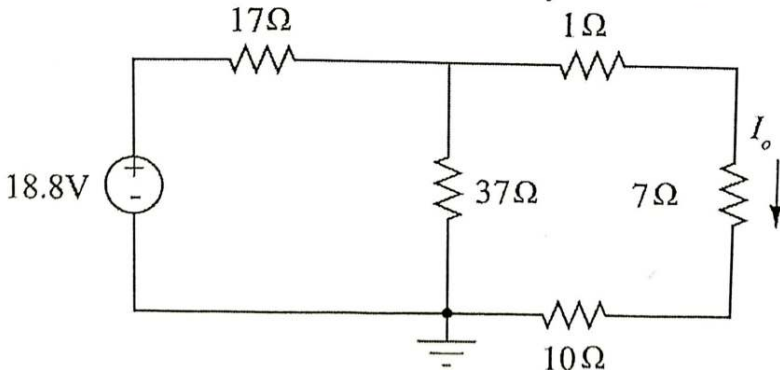
Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Fall 2025
Course Code: CSE121, Course Title: Electrical Circuits
Level:1 Term:3 Batch: 68

Time: 02:00 Hrs

Marks: 40

Answer **ALL** Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Define leading and lagging power factors.	2	CO1
	b)	Illustrate the angular frequency of AC system.	2	
	c)	Why is Source Transformation theorem useful in circuit analysis?	2	
	d)	Define the average value and r.m.s value.	2	
	e)	Define Maximum Amplitude and frequency.	2	
2.	a)	Use mesh analysis Solve the circuit to obtain i_o . 	5	CO2
	b)	Solve the circuit to find the the power absorbed by the resistor 10Ω. 	5	

3.	a) Analyze the voltage-current relationship to demonstrate capacitor current (i_c) leads the capacitor voltage (v_c) and inductor current (i_L) lags the inductor voltage (v_L).	5	CO3
	b) The voltage across a 3 resistor is as indicated where frequency is 60 Hz. Analyze to find the sinusoidal expression for the current. In addition, sketch the v and i sinusoidal waveforms on the same axis. I. $6 \cos(2\pi ft + 10^\circ)$ II. $-12 \sin(2\Omega ft + 40^\circ)$	5	
	c) Analyze the circuit to- - Determine I, V_R, and V_C in phasor form. - Calculate the total power factor, and indicate whether it is leading or lagging. - Calculate the average power delivered to the circuit. - Draw the impedance diagram. - Draw the phasor diagram of the voltages E, V_R, and V_C, and the current I.	5x2=10	

