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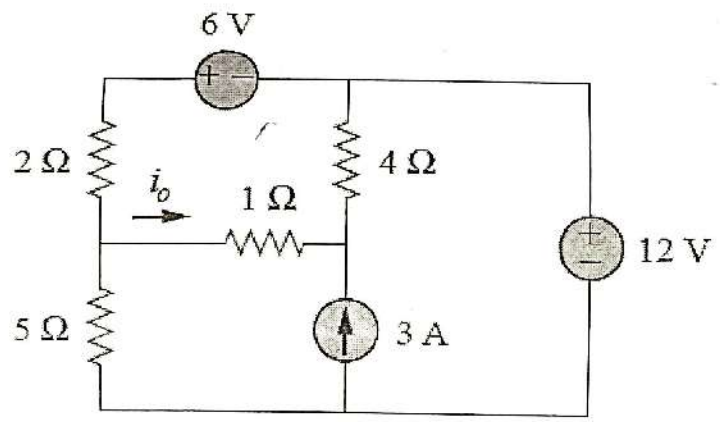
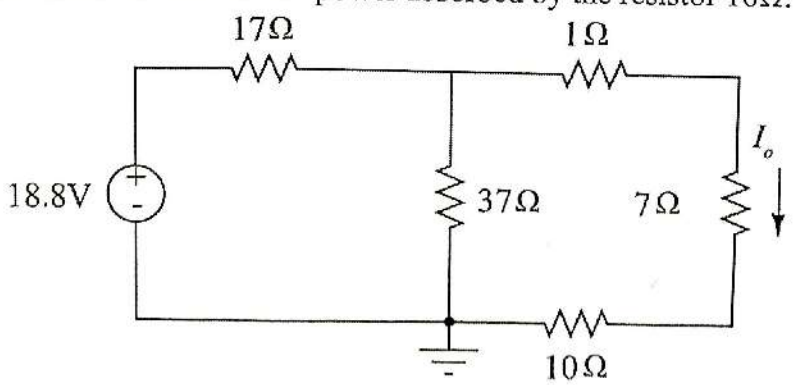
Daffodil International University

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

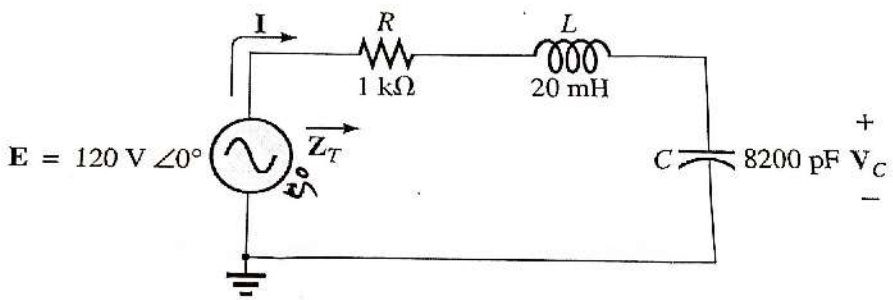
Time: 02:00 Hrs **Marks: 40**

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 *io*. 	5	CO2
	b)	**Solve** the circuit to find the the power absorbed by the resistor 10Ω. 	5	

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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. $6\cos(2\pi ft + 10°)$ II. $-12\sin(2\Omega ft + 40°)$	**5**	
	c)	**Analyze** the circuit to- i. Determine I, V_R, and V_C in phasor form. ii. Calculate the total power factor, and indicate whether it is leading or lagging. iii. Calculate the average power delivered to the circuit. iv. Draw the impedance diagram. v. Draw the phasor diagram of the voltages E, V_R, and V_C, and the current I. 	**5x2=10**	