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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Examination, Summer 2025

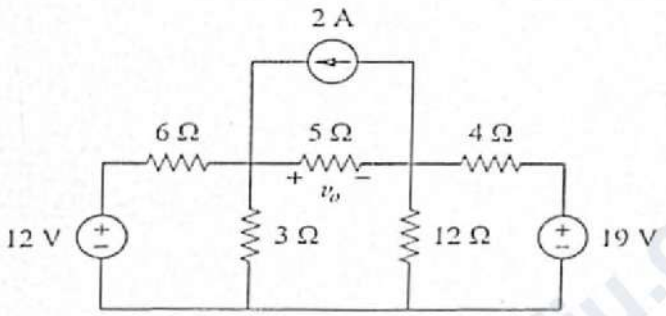
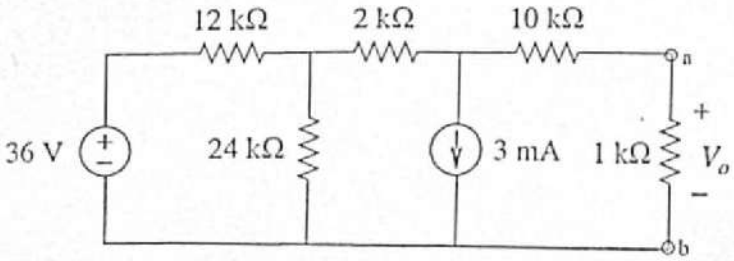
Course Code: CSE121, Course Title: Electrical Circuits

Level:1 Term:3 Batch: 67

Time: 02:00 Hours | Marks: 40

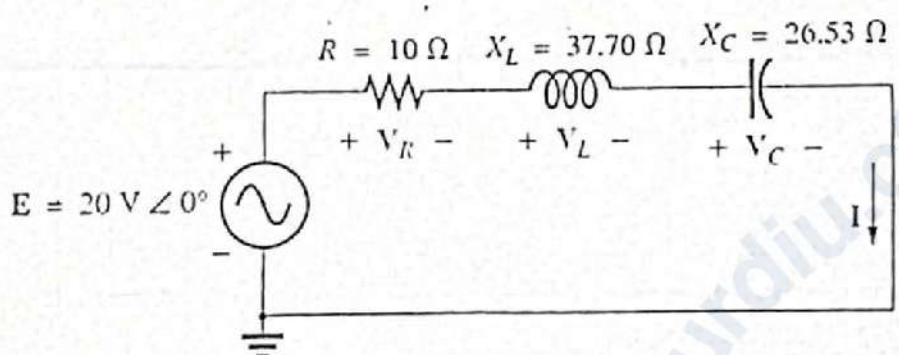
Answer ALL Questions

[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 Peak Amplitude, waveform, Peak-to-peak value, and Frequency.	5x2=10	CO 1
	b)	What is the RMS value of a sinusoidal voltage, and why is it important?		
	c)	Define power factor. What does a leading or lagging power factor indicate?		
	d)	Interpret the frequency response of R, L, C elements.		
	e)	Draw a sinusoidal waveform of an AC source and indicate all the components.		
2.	a)	Solve this circuit to find V_0 by applying the superposition theorem. 	6	CO 2
	b)	Solve the following circuit to obtain the Thevenin equivalent circuit of the figure below. What is the difference between maximum power and the normal power delivered at the a-b node? 	6	

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3.	a)	For the following pairs of voltages and currents, analyze whether the element involved is a capacitor, an inductor, or a resistor. a) V= 100 sin(ωt+50°) I= 40 sin (ωt +50 °) b) V=500 sin (377t+10 °) I= 400 sin (377t-80 °) c) V=500 sin (ωt +30 °) I= 300 sin (ωt +120 °)	6	CO 3
	b)	Analyze the voltage-current relationship of an ideal capacitor and demonstrate, using appropriate mathematical reasoning, why the average power dissipated over a complete cycle is zero watts	6	
	c)	Analyze the circuit to- i. Find Z_T, I, V_R, and V_C in phasor form. ii. Calculate the total power factor, and indicate whether it is leading or lagging. iii. Draw the phasor diagram of the voltages E, V_R, and V_C, and the current I. 	3x2=6	