



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_o by applying the superposition theorem. <div style="text-align: center;"> </div>	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? <div style="text-align: center;"> </div>	6	

3.	<p>a) For the following pairs of voltages and currents, analyze whether the element involved is a capacitor, an inductor, or a resistor.</p> <p>a) $V = 100 \sin(\omega t + 50^\circ)$ $I = 40 \sin(\omega t + 50^\circ)$</p> <p>b) $V = 500 \sin(377t + 10^\circ)$ $I = 400 \sin(377t - 80^\circ)$</p> <p>c) $V = 500 \sin(\omega t + 30^\circ)$ $I = 300 \sin(\omega t + 120^\circ)$</p>	6	CO 3
	<p>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</p>	6	
	<p>c) Analyze the circuit to-</p> <ol style="list-style-type: none"> Find Z_T, I, V_R, and V_C in phasor form. Calculate the total power factor, and indicate whether it is leading or lagging. Draw the phasor diagram of the voltages E, V_R, and V_C, and the current I. <div style="text-align: center;"> </div>	3x2=6	