



**Daffodil International University**  
**Department of Computer Science and Engineering**  
**Faculty of Science & Information Technology**  
**Midterm Examination, Fall 2022**

Course Code: CSE132      Course Title: Electrical Circuits  
 Level: 1      Term: 3      Batch: No

Time: 1:30 Hrs

Full Marks: 25

Answer all the following Three questions  
 [All portions of each question must be answered sequentially]

Q1.	<p>a. Define a node in an electrical circuit.</p> <p>b. Show the DC and AC voltage in time domain.</p> <p>c. Recall the name of few passive electrical elements.</p> <p>d. Show the electrical quantities of an open circuit.</p> <p>e. What do you mean by the Current Divider Rule (CDR)?</p>	5x1 =5	CO1
Q2.	<p>a. Explain each step and derive the general equation of Voltage Divider Rule (VDR).</p> <p>b. The PCs, Lights, Fans, Projector, ACs in a lab room have different resistances. Explain each step and find out the equivalent resistance of the room circuit (<math>R=47\Omega</math>).</p> <div style="text-align: center;"> </div>	2x5 =10	CO2
Q3.	<p>a. Using Nodal Analysis, solve the following circuit to find out the node voltages and <math>v_o</math>.</p> <div style="text-align: center;"> </div>	2x5 =10	CO3
	<p>b. Using Mesh Analysis, solve the following circuit to find out the loop currents and <math>v_{ab}</math>.</p> <div style="text-align: center;"> </div>		



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**Final Examination, Fall 2022**

Course Code: CSE132      Course Title: Electrical Circuits  
 Level: 1      Term: 3      Batch: No

Time: 2:00 Hrs

Full Marks: 40

Answer ALL the following Three Questions

*[All portions of each question must be answered sequentially]*

1.	a.	Name at least three theorems to solve complex Electrical Circuits.	5x2 =10	CO1
	b.	Tell the names of 2 types of waveform with figures.		
	c.	What do you mean by the frequencies of 900MHz, 1800MHz etc which are used by the GSM operators?		
	d.	Define the periodic waveform of a current or a voltage.		
	e.	Show the peak to peak value of a power waveform.		
2.	a.	Show that the Average value of a sinusoidal current wave is $I_{avg} = \frac{2I_m}{\pi}$ .	3x5 =15	CO2
	b.	Show that the current passes through a pure Inductor lags the voltage across the inductor by $90^\circ$ .		
	c.	Show that the average power or real power of an electrical circuit is $P = VI \cos \theta$ .		
3.	a.	A sophisticated factory has a capacitor bank of $10\mu F$ capacitance. If the current through the capacitor bank is $i = 10 \sin(377t - 45^\circ)$ , then  Solve to find out the sinusoidal expression of the voltage across the capacitor bank including a sketch of the corresponding $v(t)$ and $i(t)$ curves.	3x5 =15	CO3
	b.	If the supply voltage and the total current of an RLC series circuit are $v = 200 \sin(377t + 60^\circ)$ and $i = 20 \sin(377t - 60^\circ)$ respectively, then  I. Solve to find out the average power, reactive power and apparent power. II. Solve to find out the power factor and also mention whether it is leading or lagging.		
	c.	Solve to find out the mesh currents using mesh analysis (Consider that there is no current source in the circuit, i.e. the branch has only resistance).		

