

**EEM 201  
ELECTRICAL CIRCUIT  
LABORATORY-I  
RESULTS OF LAB EXPERIMENTS**

*Prepared by:*

**T. Özge ÖZDİNÇ ONUR**

**BÜLENT ECEVİT UNIVERSITY**

**FACULTY OF ENGINEERING**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**ZONGULDAK, 2023**



**ZONGULDAK  
BÜLENT ECEVİT ÜNİVERSİTESİ  
1992**

Electrical-Electronics Engineering Department  
Electric Circuits Laboratory-I  
(EEM201)

Lab Report #1  
Experiment #1

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**Experiment Coordinator**

Student Name .....

Student ID.....

**Experiment Participants**

Student Name .....

Student ID.....

Student Name .....

Student ID.....

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 1: Serial and Parallel Connected Resistor Applications

**Lab. Group No :**

**Prepared By :** .....

**Table 1:** The results of the calculations and measurements of Figure 1.

R1	R2	V1	I1	V2	I2	Pin	P1	P2
1K	1K							
1K	2K							
2K	1K							
10K	100							
1K	1M							

**Table 2:** The results of the calculations and measurements of Figure 2.

R1	R2	V1	I1	V2	I2	Pin	P1	P2
1K	1K							
1K	2K							
2K	1K							
10K	100							
1K	1M							

**Table 3:** The results of the calculations and measurements of Figure 3.

R1	R2	V1	I1	V2	I2	Pin	P1	P2
1K	1K							
1K	2K							
2K	1K							
10K	100							
1K	1M							

**Table 4:** The results of the calculations and measurements of Figure 4.

R1	R2	V1	I1	V2	I2	Pin	P1	P2
1K	1K							
1K	2K							
2K	1K							
10K	100							
1K	1M							

**CONCLUSION AND COMMENTS:**

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values obtained from measurements with theoretical calculations.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 2: Serial and Parallel Connected Resistor Applications

**Lab. Group No :**

**Prepared By :** ..... ; .....

**Table 1:** The results of the measurements of Figure 1 for  $V_{in} = 10$ .

<b>R<sub>1</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>3</sub></b>	<b>V<sub>1</sub></b>	<b>V<sub>2</sub></b>	<b>V<sub>3</sub></b>	<b>I<sub>1</sub></b>	<b>I<sub>2</sub></b>	<b>I<sub>3</sub></b>
1k	2k	2k						
1k	2k	4k						
4k	2k	2k						
2k	2k	2k						
1k	4k	2k						
4k	4k	2k						

**Table 2:** The results of the measurements of Figure 2.

	Calculated/Measured Quantity ( $V_{in} = 12V$ , $I_y = 1A$ , $R_1 = 1\Omega$ , $R_2 = 1\Omega$ and $R_3 = 2\Omega$ )	Value and Unit
<b>1</b>	V3	
<b>2</b>	I3	
<b>3</b>	P3	

**CONCLUSION AND COMMENTS:**

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values obtained from measurements with theoretical calculations.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 3: Node and Mesh Current Analysis Methods

**Lab. Group No:**

**Prepared By :** .....; .....

**Table 1:** The results of the measurements

	Calculated/Measured Quantity	Value and Unit
1	V4	
2	V5	
3	I1	
4	I2	
5	I3	
6	I4	
7	I5	

### CONCLUSION AND COMMENT:

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values obtained from measurements with theoretical calculations.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 4: Thevenin-Norton Theorems and Maximum Power Transfer

**Lab. Group No:**

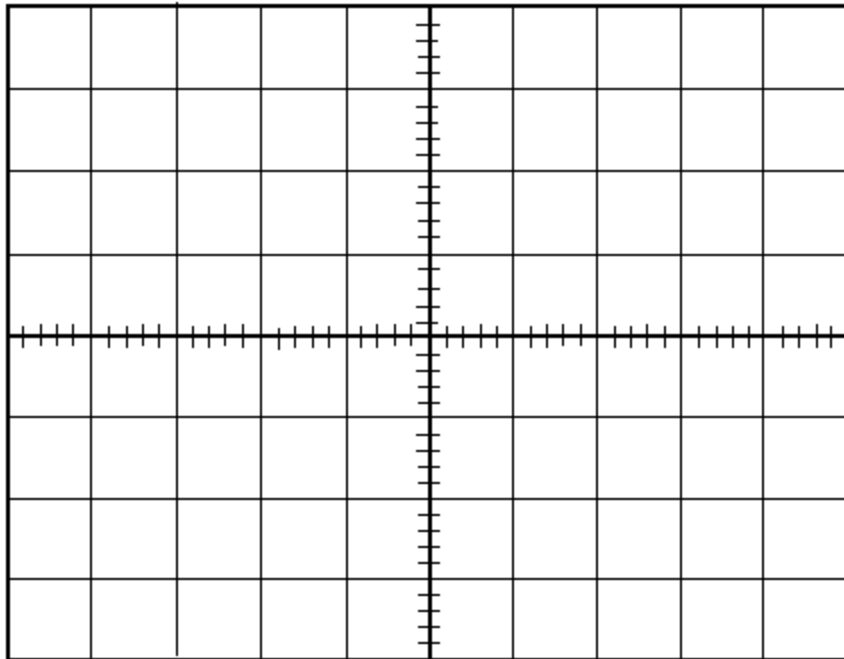
**Prepared By :** .....; .....

**Table 1:** The results of the measurements

	Calculated/Measured Quantity	Value and Unit				
1	Open circuit voltage between A – B ( $V_T$ )					
2	Short circuit current between A – B ( $I_{KD}$ )					
3	The resistor between A-B					
4	Check if ( $R_T$ ) is ( $V_T$ ) / ( $I_{KD}$ )					
5	Set the value of adjustable resistor resistor from 1 k $\Omega$ to 10 k $\Omega$ and measure the voltages between A – B. Determine the power transmitted to these resistor values by using voltage values you found and resistor values you used.	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>
		<b>P6</b>	<b>P7</b>	<b>P8</b>	<b>P9</b>	<b>P10</b>



**Table 2:** The graph of the resistor-power according to the resistor values for the measurements



**CONCLUSIONS AND COMMENTS:**

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values obtained from measurements with theoretical calculations.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 5: Superposition Principle

**Lab. Group No:**

**Prepared By :** .....; .....

**Table 1:** The results of the measurements for Figure 1

	Calculated/Measured Quantity	Value and Unit
1	V1	
2	V2	
3	V3	
4	I1	
5	I2	
6	I3	

**Table 2:** The results of the measurements for Figure 2

	Calculated/Measured Quantity	Value and Unit
1	$V_1'$	
2	$V_2'$	
3	$V_3'$	
4	$I_1'$	
5	$I_2'$	
6	$I_3'$	

**Table 3:** The results of the measurements for Figure 3

	<b>Calculated/Measured Quantity</b>	<b>Value and Unit</b>
<b>1</b>	$V_1''$	
<b>2</b>	$V_2''$	
<b>3</b>	$V_3''$	
<b>4</b>	$I_1''$	
<b>5</b>	$I_2''$	
<b>6</b>	$I_3''$	

**Analysis**

1. Observe that sum of the values obtained from step B and step C is equal to the values obtained from step A.
2. Compare the total values from theoretical calculations with the values obtained from measurements.
3. Interpret if superposition principle is applicable for circuit analysis.

**CONCLUSION AND COMMENT:**

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values you obtained from theoretical calculations with measurements.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

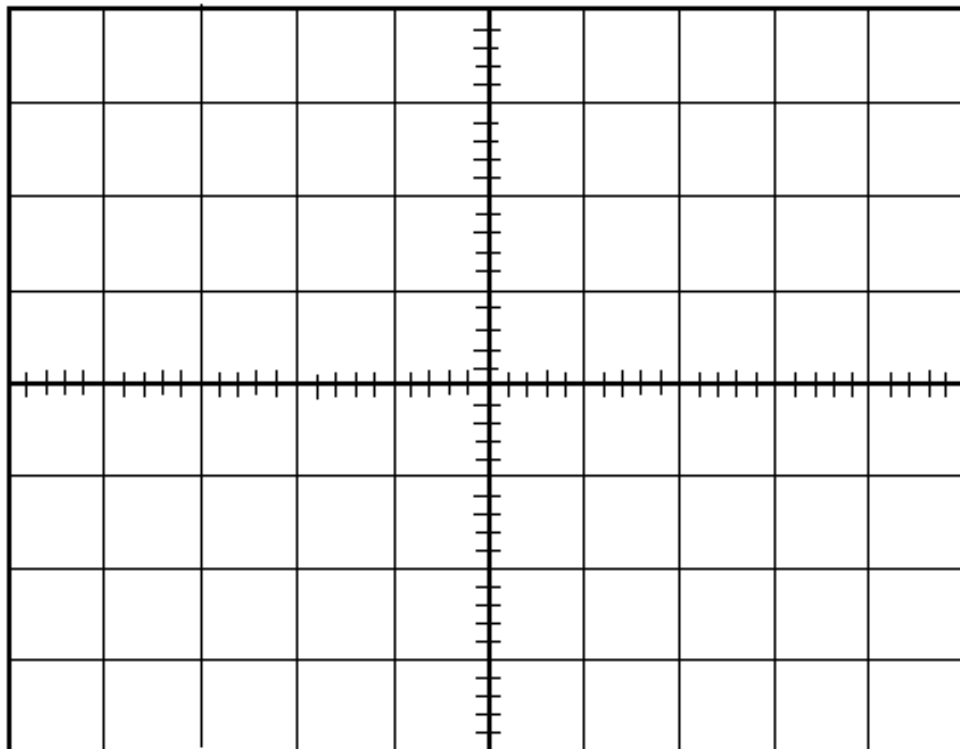
(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 6: Natural Response of RL and RC Circuits

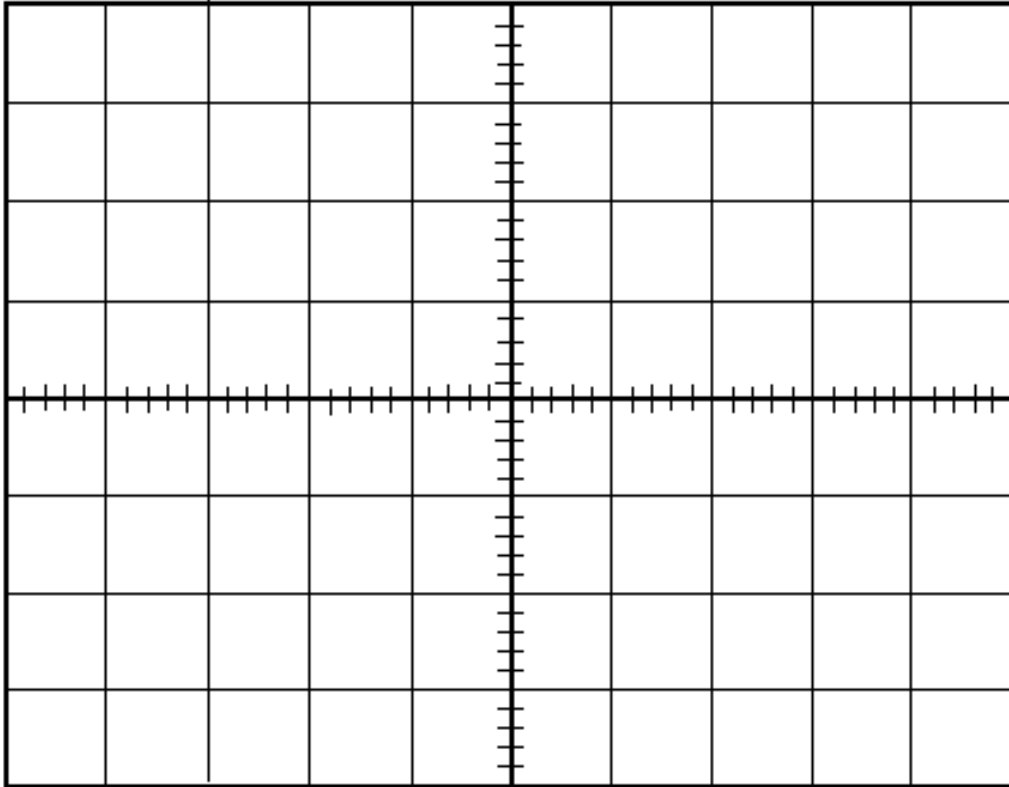
Lab. Group No:

Prepared By : .....; .....

**Table 1:** The graph of voltage-time for RL circuit.

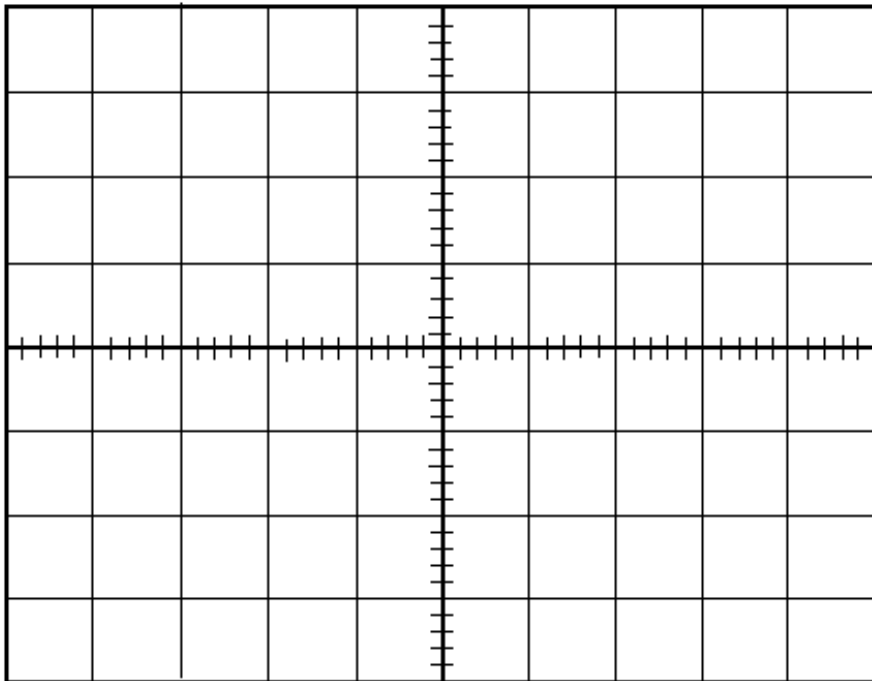


**Table 2:** The graph of current-time for RL circuit.

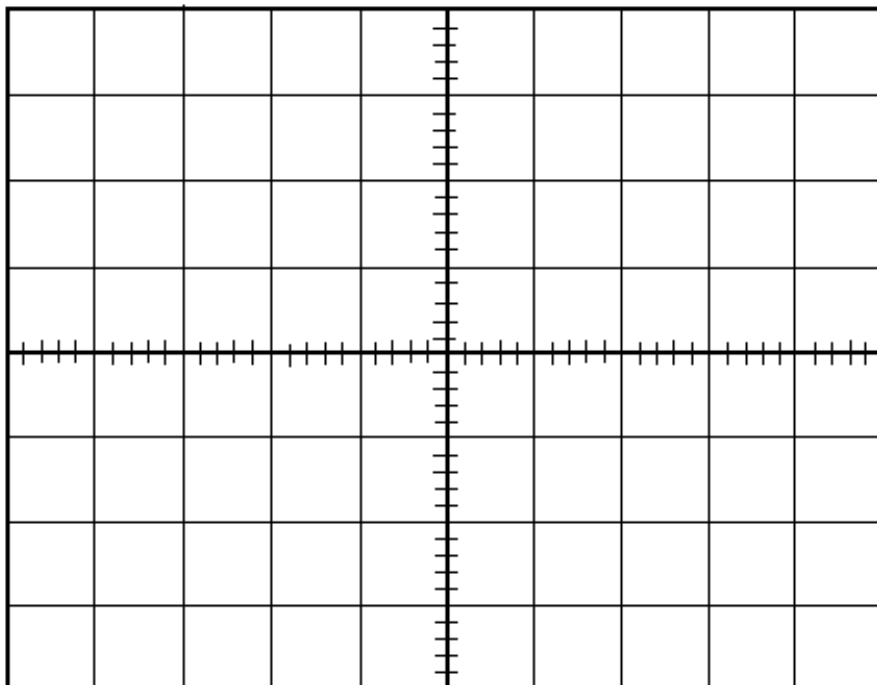


Calculated/Measured Quantity	Value and Unit
Time constant	

**Table 3:** The graph of voltage-time for RC circuit.



**Table 4:** The graph of current-time for RC circuit.



Calculated/Measured Quantity	Value and Unit
Time constant	

**CONCLUSIONS AND COMMENTS:**

1. Report all processes and measurements made in the experiment. Add your comment.
2. Calculate theoretical calculations of circuit and compare them with measurements.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

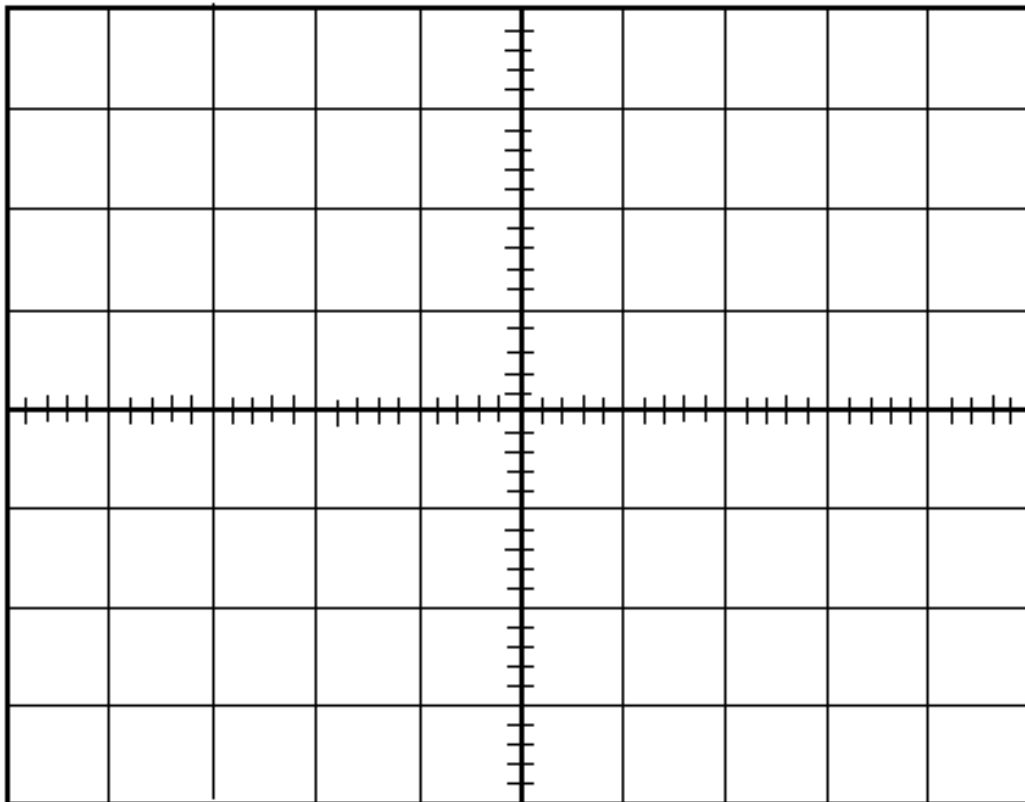
(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 7: Step Responses of RL and RC Circuits

Lab. Group No :

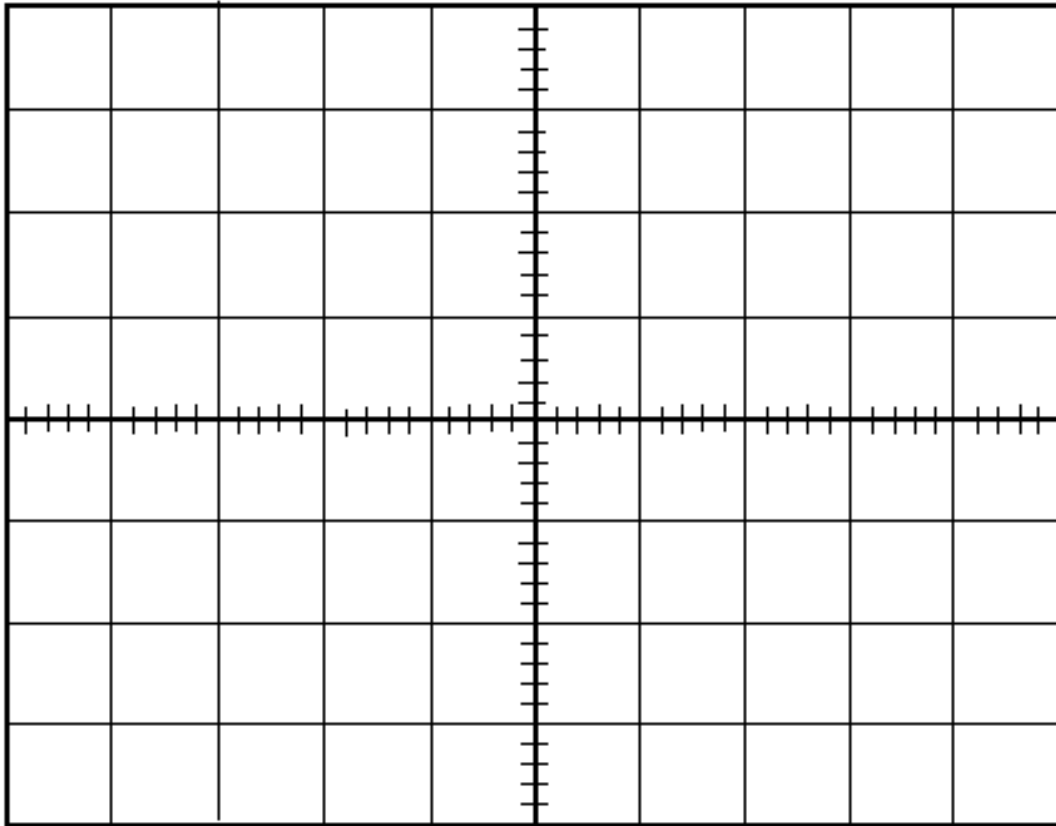
Prepared By : ..... ; .....

**Table 1:** The graph of voltage-time for RL circuit.



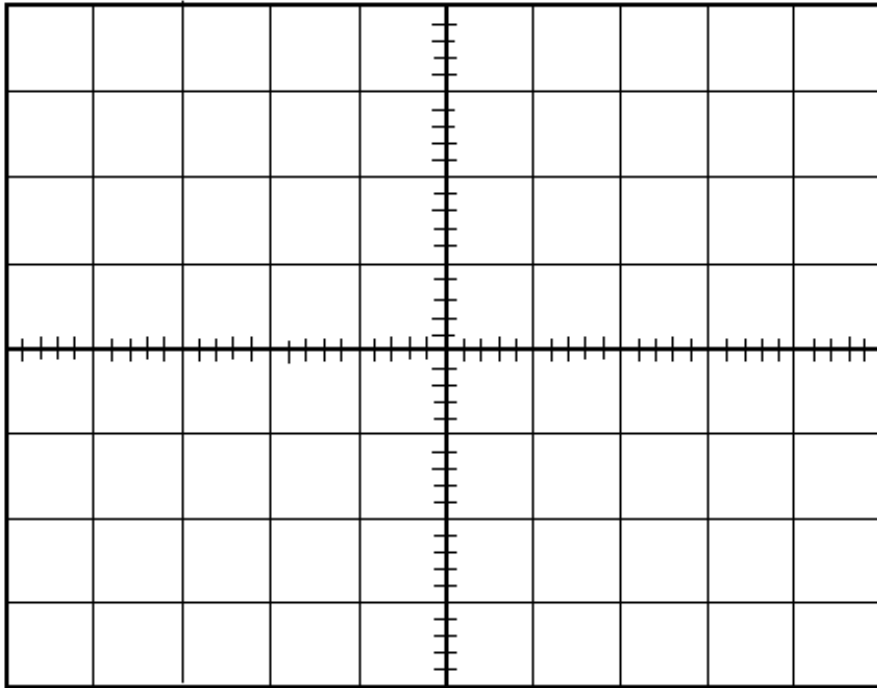


**Table 2:** The graph of current-time for RC circuit.

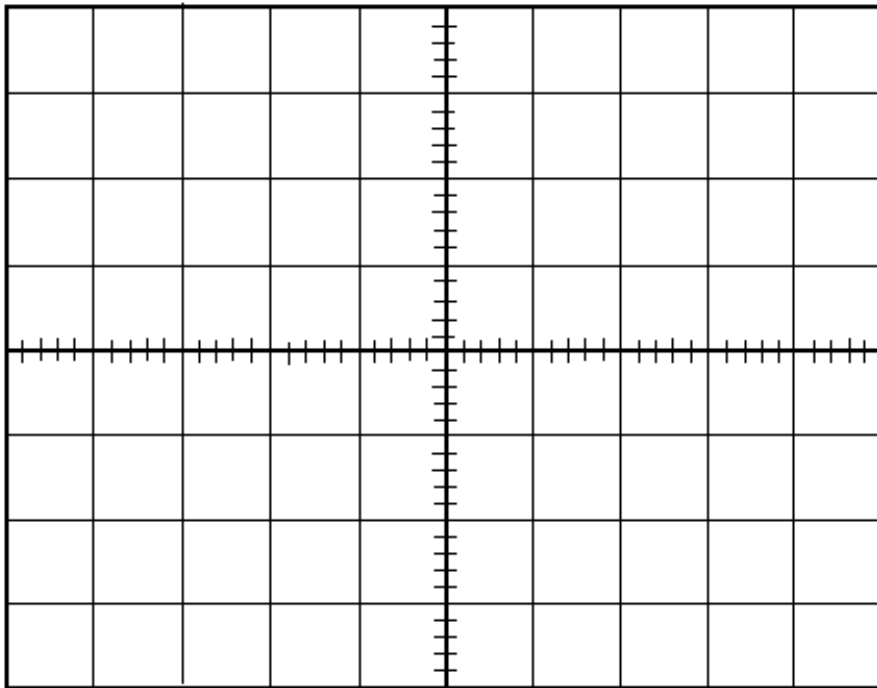


Calculated/Measured Quantity	Value and Unit
Time constant	

**Table 3:** The graph of voltage-time for RC circuit.



**Table 4:** The graph of current-time for RC circuit.



Calculated/Measured Quantity	Value and Unit
Time constant	

**CONCLUSIONS AND COMMENTS:**

1. Report all processes and measurements obtained in the experiment. Add your comments.
2. Calculate theoretical calculations of circuit and compare them with measurements.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 8: Natural Response of Parallel R-L-C Circuit

Lab. Group No :

Prepared By : ..... ; .....

**Table 1:** The results of the measurements

	Calculated/Measured Quantity	Value and Unit
1.	Initial value of $V_C$	
2.	Initial value of I	
3.	V(t)	

- Find the response type of the circuit.

### CONCLUSIONS AND COMMENTS:

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values you obtained from theoretical calculations with measurements.

Laboratory Supervisor Approval:

## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 9: Unit Step Response of Parallel R-L-C Circuit

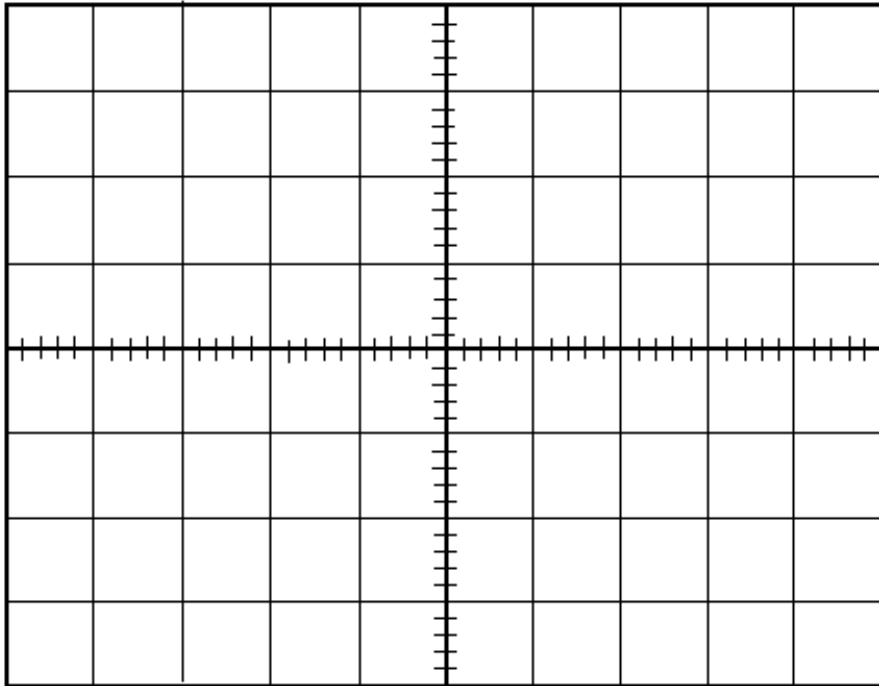
Lab. Group No :

Prepared By : ..... ; .....

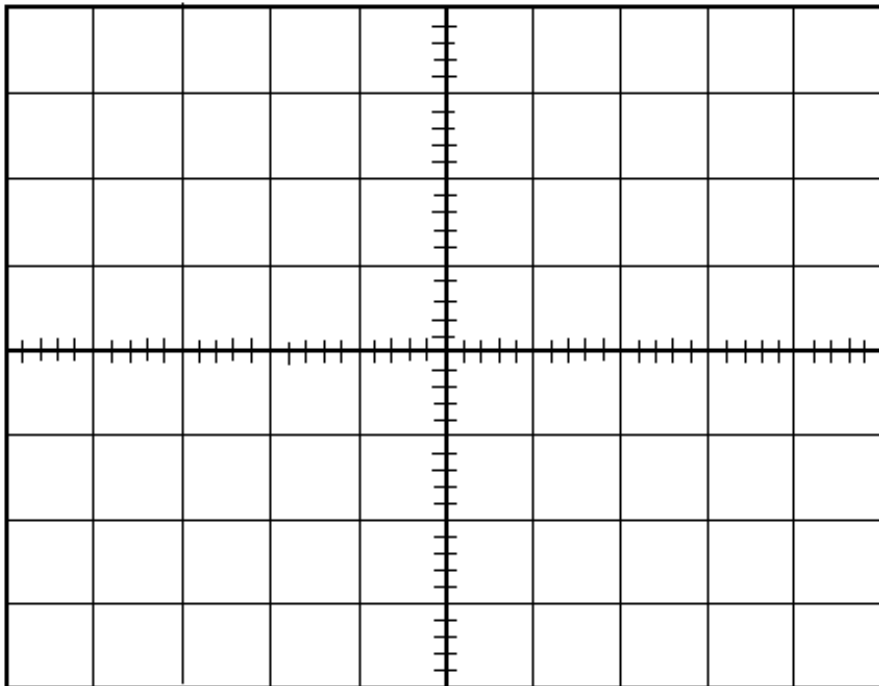
**Table 1:** The results of the measurement

	Calculated/Measured Quantity	Value and Unit
1.	Initial value of $I_C$	
2.	Initial value of $I_L$	
3.	Initial value of $I_R$	
4.	$V(t)$	
5.	$I_C(t)$	
6.	$I_L(t)$	
7.	$I_R(t)$	

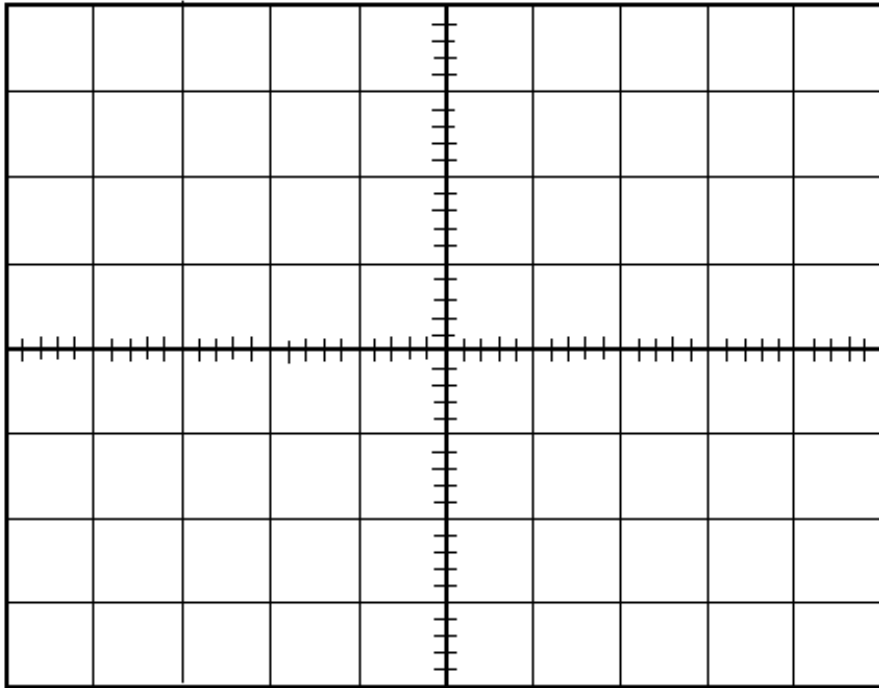
**Table 2:** The graph of  $V(t)$



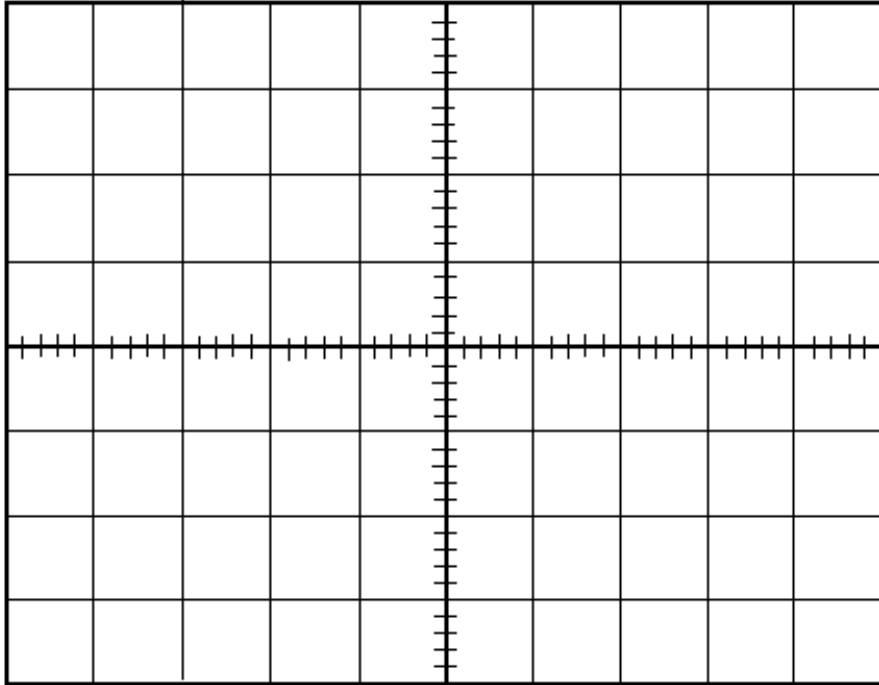
**Table 3:** The graph of  $I_C(t)$



**Table 4:** The graph of  $I_L(t)$



**Table 5:** The graph of  $I_R(t)$



**CONCLUSIONS AND COMMENTS:**

1. Report all processes and measurements made in the experiment. Add your comment.
2. Calculate theoretical calculations of circuit and compare them with measurements.

Laboratory Supervisor Approval:



## TABLES OF EXPERIMENTAL RESULTS

(At the end of the experiment, please have the lab. supervisor ratify this experiment results table and deliver it)

### Experiment 10: Natural And Unit Step Responses Of Serial R-L-C Circuit

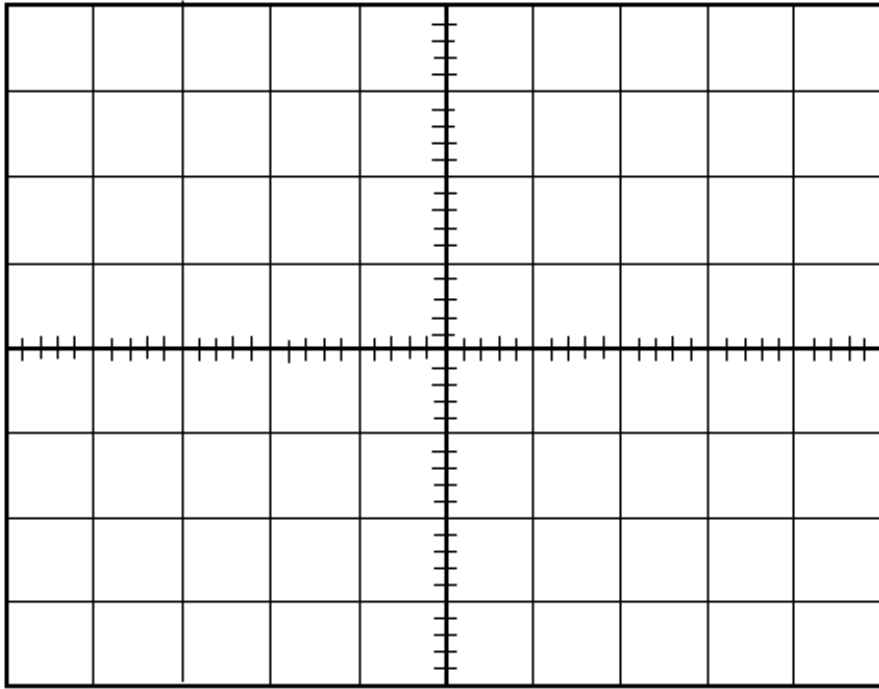
Lab. Group No :

Prepared By : ..... ; .....

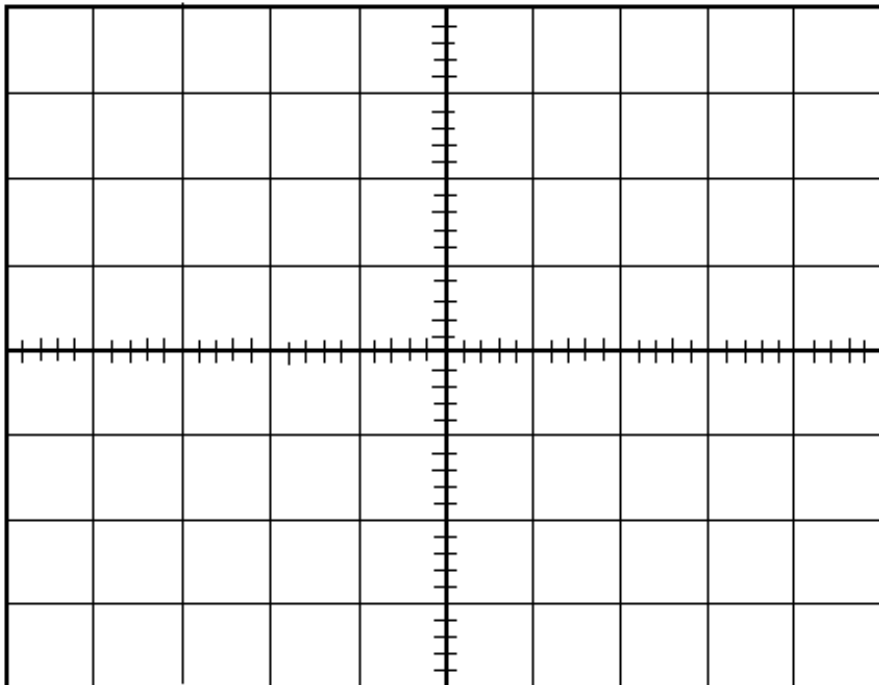
**Table 1:** The results of the measurement

	Calculated/Measured Quantity	Value and Unit
1.	Initial value of $V_C$	
2.	Initial value of $V_L$	
3.	Initial value of $V_R$	
4.	$I_C(t)$	
5.	$V_C(t)$	
6.	$V_L(t)$	
7.	$V_R(t)$	

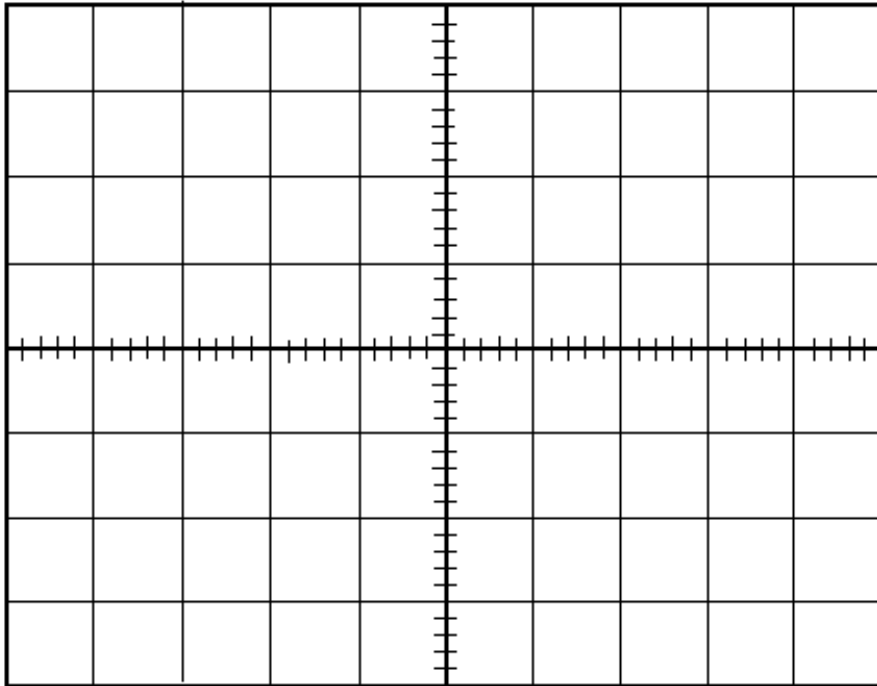
**Table 2:** The graph of  $I_C(t)$



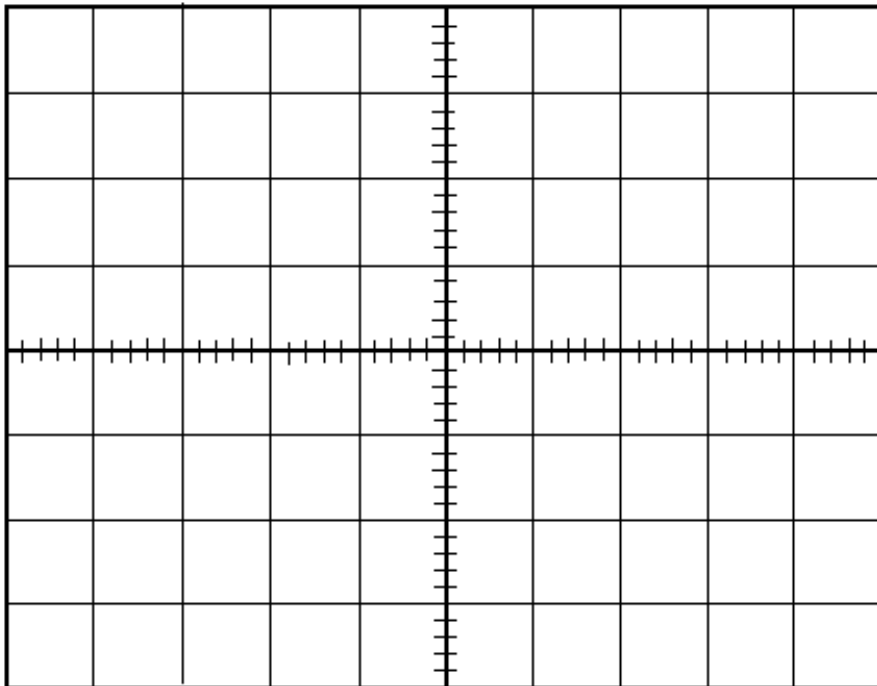
**Table 3:** The graph of  $V_C(t)$



**Table 4:** The graph of  $V_L(t)$



**Table 5:** The graph of  $V_L(t)$



## **CONCLUSIONS AND COMMENTS**

1. Report all measurements and operations done in the experiment section. Add your comments.
2. Compare the values you obtained from theoretical calculations with measurements.

Laboratory Supervisor Approval: