|  |
| --- |
|  |
|

|  |  |  |
| --- | --- | --- |
| **Lab on RC and RL Circuits**  | **Name** |  |
|  |  |  |
|  | **Date** |  |

 |
|  |
|

|  |  |  |
| --- | --- | --- |
|  | **Partner #1** |  |
|  |  |  |
|  | **Partner #2** |  |

 |
|  |
| **RC and RL CircuitsWorksheet** |
|  |
| **Experiment #1 – RC Circuit #1:** |
|  |
| **Complete and fill in Data Table 01** |
|  |
|

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RC Circuit** | **#1** |  |  |  |  |
|  |  |  |  |  |  |
| **R ()** | **1000** |  |  |  |  |
| **Nominal C (F)** | **0.1** |  |  | **Slope (1/s)** |  |
| **Frequency (Hz)** |  |  |  | ** (s)** |  |
| **Time Base (ms)** |  |  |  | **Measured C (F)** |  |
|  |  |  |  | **%diff** |  |
|  |  |  |  |  |  |
| **V/V0** | **t - boxes** | **t (s)** | **1-V/V0** | **ln(1-V/V0)** |  |
| **0.1** |  |  |  |  |  |
| **0.3** |  |  |  |  |  |
| **0.5** |  |  |  |  |  |
| **0.7** |  |  |  |  |  |
| **0.9** |  |  |  |  |  |

 |
|  |
| Produce a full-page plot of ln(1-V/V0) on the y-axis and t on the x-axis. Make sure you have a properly formatted title and axis labels. Include a properly formatted trend-line on the plot as well. |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| **Experiment #2 – RC Circuit #2:** |
|  |
| **Complete and fill in Data Table 02** |
|  |
|

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RC Circuit** | **#2** |  |  |  |  |
|  |  |  |  |  |  |
| **R ()** | **270** |  |  |  |  |
| **Nominal C (F)** | **0.56** |  |  | **Slope (1/s)** |  |
| **Frequency (Hz)** |  |  |  | ** (s)** |  |
| **Time Base (ms)** |  |  |  | **Measured C (F)** |  |
|  |  |  |  | **%diff** |  |
|  |  |  |  |  |  |
| **V/V0** | **t - boxes** | **t (s)** | **1-V/V0** | **ln(1-V/V0)** |  |
| **0.1** |  |  |  |  |  |
| **0.3** |  |  |  |  |  |
| **0.5** |  |  |  |  |  |
| **0.7** |  |  |  |  |  |
| **0.9** |  |  |  |  |  |

 |
|  |
| Produce a full-page plot of ln(1-V/V0) on the y-axis and t on the x-axis. Make sure you have a properly formatted title and axis labels. Include a properly formatted trend-line on the plot as well. |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| **Experiment #3 – RL Circuit #1:** |
|  |
| **Complete and fill in Data Table 03** |
|  |
|

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RL Circuit** | **#1** |  |  |  |  |
|  |  |  |  |  |  |
| **R ()** | **100** |  |  |  |  |
| **Nominal L (mH)** | **10** |  |  | **Slope (1/s)** |  |
| **Frequency (Hz)** |  |  |  | ** (s)** |  |
| **Time Base (ms)** |  |  |  | **Measured L (mH)** |  |
|  |  |  |  | **%diff** |  |
|  |  |  |  |  |  |
| **V/V0** | **t - boxes** | **t (s)** | **1-V/V0** | **ln(1-V/V0)** |  |
| **0.1** |  |  |  |  |  |
| **0.3** |  |  |  |  |  |
| **0.5** |  |  |  |  |  |
| **0.7** |  |  |  |  |  |
| **0.9** |  |  |  |  |  |

 |
|  |
| Produce a full-page plot of ln(1-V/V0) on the y-axis and t on the x-axis. Make sure you have a properly formatted title and axis labels. Include a properly formatted trend-line on the plot as well. |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| **Experiment #4 – RL Circuit #2:** |
|  |
| **Complete and fill in Data Table 04** |
|  |
|

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RL Circuit** | **#2** |  |  |  |  |
|  |  |  |  |  |  |
| **R ()** | **470** |  |  |  |  |
| **Nominal L (mH)** | **2.2** |  |  | **Slope (1/s)** |  |
| **Frequency (Hz)** |  |  |  | ** (s)** |  |
| **Time Base (ms)** |  |  |  | **Measured L (mH)** |  |
|  |  |  |  | **%diff** |  |
|  |  |  |  |  |  |
| **V/V0** | **t - boxes** | **t (s)** | **1-V/V0** | **ln(1-V/V0)** |  |
| **0.1** |  |  |  |  |  |
| **0.3** |  |  |  |  |  |
| **0.5** |  |  |  |  |  |
| **0.7** |  |  |  |  |  |
| **0.9** |  |  |  |  |  |

 |
|  |
| Produce a full-page plot of ln(1-V/V0) on the y-axis and t on the x-axis. Make sure you have a properly formatted title and axis labels. Include a properly formatted trend-line on the plot as well. |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |