**Experiment 24**: Transient Simulations and Voltage Follower Circuits

(Edit this document as needed)

Partner 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Part A*

LTspice schematic of the voltage divider circuit with a sinusoidal source.

Plot of voltages in the voltage divider circuit with a sinusoidal source.

Does the voltage divider equation still explain the relationship between the source voltage and the resistor voltage?

LTspice schematic of the voltage divider circuit with a square wave source.

Plot of voltages in the voltage divider circuit with a square wave source.

Does the voltage divider equation still explain the relationship between the source voltage and the resistor voltage?

*Part B*

LTspice schematic of the experiment 22 RC circuit.

Plot of voltages for the experiment 22 RC circuit.

Estimate of the time constant, τ, using simulation results.

|  |  |
| --- | --- |
| τsimated | [s] |

How does the above value compare to your experiment 22 results?

LTspice schematic of the experiment 23 RL circuit.

Plot of voltages for the experiment 23 RL circuit.

Estimate of the time constant, τ, using simulation results.

|  |  |
| --- | --- |
| τsimated | [s] |

How does the above value compare to your experiment 23 results?

LTspice schematic of the experiment 23 RLC circuit.

Plot of voltages for the experiment 23 RLC circuit.

Estimate of the attenuation constant, α, and oscillation frequency, β, using simulation results.

|  |  |
| --- | --- |
| α | [s-1] |
| β | [rad/s] |

How does the above value compare to your experiment 23 results?

*Part C*

Alice Desktop plot of input and output voltages of the voltage follower circuit with a voltage source input.

Alice Desktop plot of input and output voltages of the voltage follower circuit with the RC circuit from experiment 20.

Are the results the same as seen in experiment 20?

Due: April 25nd, 2022 at 11:59 pm eastern on Gradescope

One student submits on Gradescope and adds their partner using “add group members” option on Gradescope.