Birzeit University
Faculty of Engineering and Technology
Department of Electrical and Computer Engineering
Circuit Analysis – ENEE2304
PSpice Assignment

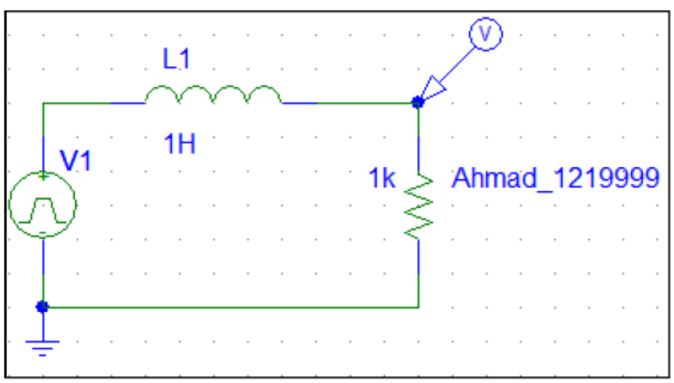
Important Notes:

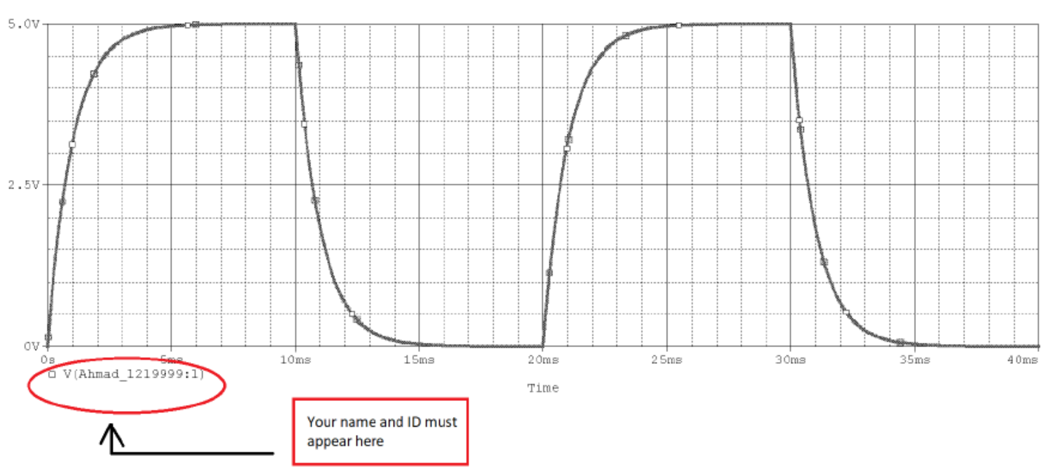
✓ The capacitor C must be named with the student name and ID. For example, if your name is Ahmad and your ID is 1219999 then, the capacitor C must be named as Ahmad_1219999. Otherwise, the problem will not be evaluated.

✓ Also, note that on the simulation window, below the plot, your name and ID (name of the component C) must appear.

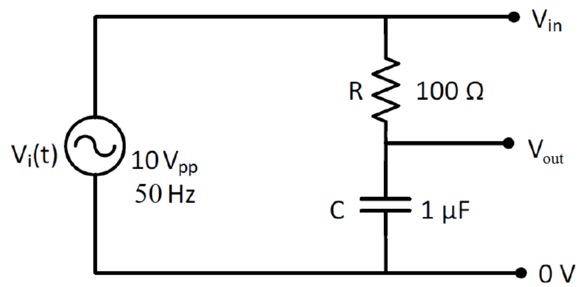
The figure below is an example of naming a **resistor** with Ahmad_1219999:

Example of a circuit and the simulation result





Question 1: Sinusoidal Steady State Analysis



For the circuit shown:

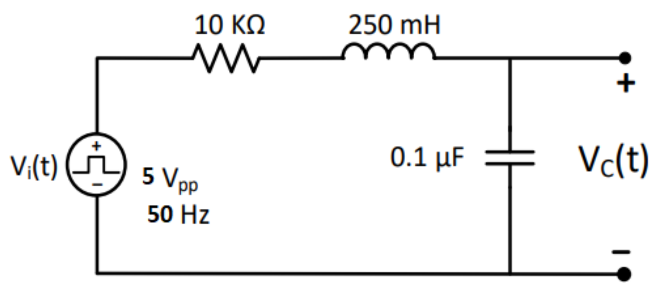
1. Use PSPICE to do a transient analysis of the circuit, and show $V_{in}(t)$ and $V_{out}(t)$ on one plot (you may need to use different Y-axes).
2. Use cursors to measure the time difference between the peaks of the two signals, then use the following relationship to calculate the phase shift using the measured time $\{\Delta\boldsymbol{\theta}=360° \times \boldsymbol{f} \times \Delta\mathbf{t}\}$.
3. Discuss the results obtained.
4. We want to change the input frequency three times, and make it equal to:

   f_2= (your ID number / 500) Hz, for example, 1219999/500 = 2439.998 Hz
   f_3 = (your ID number / 200) Hz
   f_4 = (your ID number) Hz

For each time, draw $V_{out}(t)$, compare and discuss the results obtained.

Question 2: Second-Order RLC Circuit Analysis

For the circuit:



Part A:

Find Vc(t) using Laplace transform but assume the input voltage Vi(t)= 5 volt (step function)

Part B:

The input voltage is **square signal** with 5 $V_{peak\text{-}peak}$ (0 V to 5 V) and frequency of 50Hz.

1. Use Pspice software to plot both $V_i(t)$ and $V_c(t)$ (on the same graph).
2. Change the Value of R to 3.162 kΩ, repeat step 1.
3. Change the Value of R to 500 Ω, repeat step 1.
4. Comment on each result: is it over-damping, critical-damping, or under-damping response.

All the best