

Department Of electrical and computer Engineering

ENEE2103 CIRCUITS AND ELECTRONICS LABORATORY

Experiment No.3 Prelab

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1. ***RC Circuit:***

Constructing the following circuit and received the next simulation results:





1. ***RL Circuit:***

Constructing the following circuit and received the next simulation results:





Time constant (at v = 3.6994V) =~ 1.2337mSec (at 0.37 of Vp for discharging)

the steady state values of the voltage are: 0 & +-10 V



Time constant (at I = 1.666mA) =~ 2.23mSec (at 0.37 of Ip for discharging)

the steady state values of the current are: 0 & 4.5 mA

1. ***RLC Circuit:***
2. **Response type:**



the voltage across the capacitor:



R= 2\* sqroot(L/C)

 = 2\* sqroot(0.500/100x10-9)

 = 4472 ohm

Under damping:



Critical damping:



Over damping:



1. **Response parameters:**



Decay time constant $τ=\frac{t\_{b}-t\_{a}}{ln\left(\frac{V\_{a}-V\_{o(\infty )}}{V\_{b}-V\_{o(\infty )}}\right)}$

 $τ=\frac{3.2097-1.6838}{ln\left(\frac{7.9544-4.93}{6.1192-4.93}\right)}$ $=\frac{1.5259}{ln\left(2.5432\right)}$ = 1.635