**EE 205 Circuit Theory**

**Lab 8**

**RLC Circuit Underdamped Response**

**Procedure:**

Consider the RLC circuit shown in Fig.1 with C=8.2nF, R=10k and L=4.6uH. Use a square wave source signal with 10V peak-to-peak and 5V offset at 1kHz frequency.



Fig.1. RLC Circuit

Connect an oscilloscope probe to VC(t). You may use “autoset” to view the output on the scope screen. Since this circuit is underdamped, you should observe a damped oscillation. Measure the oscillation frequency. Fill Table 1 with the measured and calculated values.

Note that

$$α=\frac{1}{2RC}$$

$$ω\_{0}=\frac{1}{\sqrt{LC}}$$

and $ω\_{d}=\sqrt{ω\_{0}^{2}-α^{2}}$

Table 1. Calculated and Measured Values

|  |  |
| --- | --- |
| Calculated Values | Measured Values |
| $α$ (Damping factor) | $ω\_{0}$ (resonant frequency) | $$ω\_{d}$$(Damped radian frequency) | Damping time ($\~5α$) | $$ω\_{d}$$ | Damping time  |
|  |  |  |  |  |  |