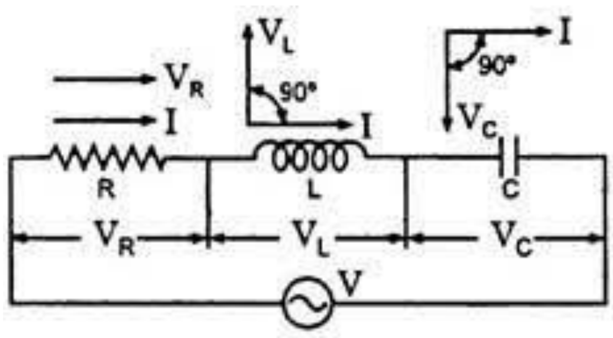
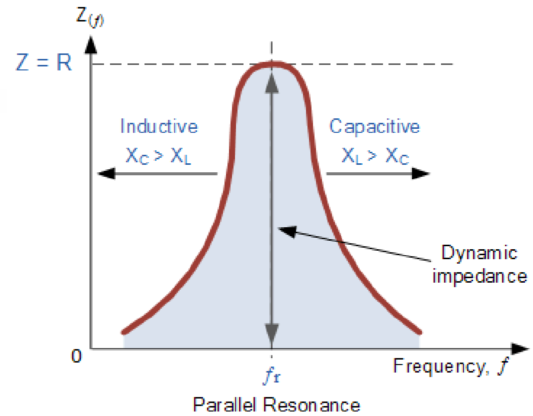
RLC Series Resonance Circuit

https://drive.google.com/file/d/1LGRmAUAqZ5jmE9j_m_R5Ofdw2zDbealC/view?usp=sharing





Given:

L=100mH
C= Try 0.33uf or 0.1uf
R= 120 Ohm
V (pk-pk) = 0.5v

Conditions:

1. **The flow of current in inductor and capacitor during resonance frequency should be maximums in compare to other frequencies.**
2. **The voltage drop on the inductor and capacitor during resonance frequency should be almost equal during frequency resonance**
3. **The phase of inductor voltage should always lead the voltage of capacitor.**
4. **During Resonance Frequency the reactance of inductor and capacitor will be equal**

XL = XC (we will prove it later)

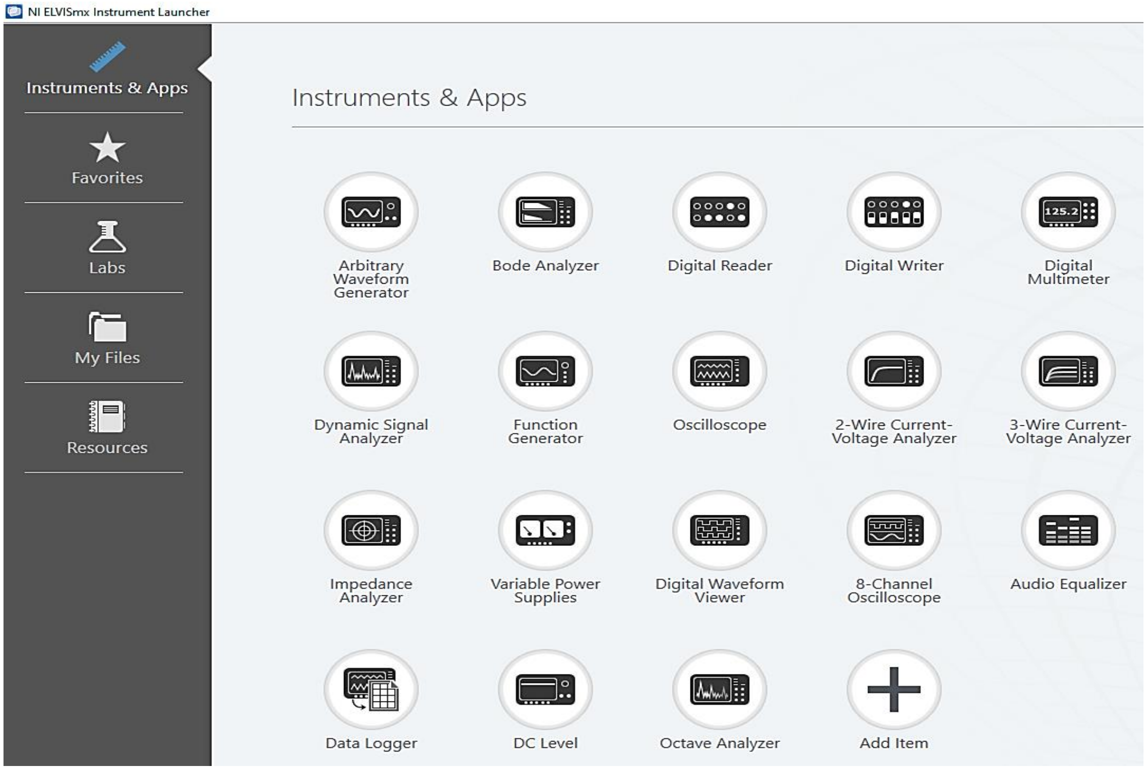
XL = 2πfL = 552 ohm

XC = 1/2πfc= 552 ohm

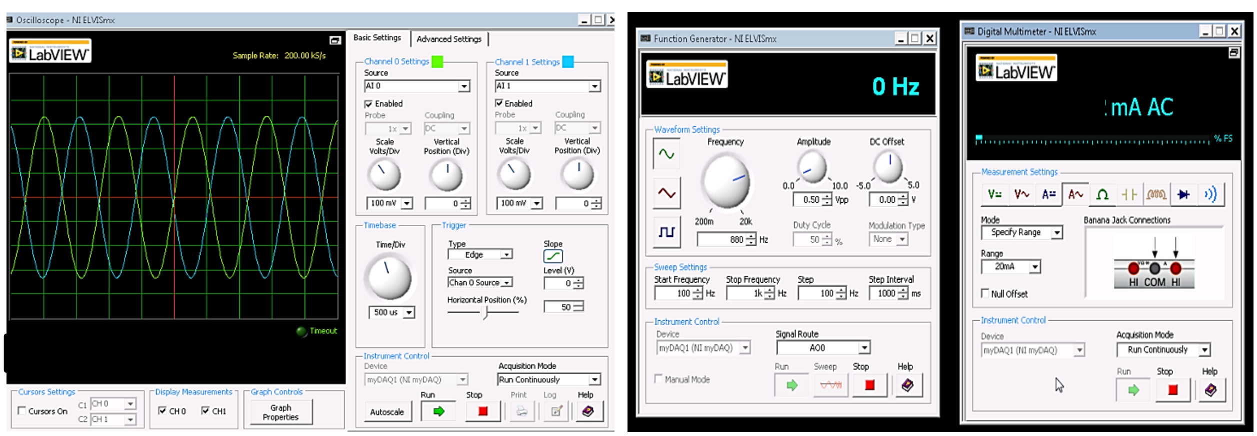
Formulae:

$V_L = V_C$
$I*X_L= I*X_C$ (same series current)
wL = 1/wC
2π*f*L = 1/2π*f*c
Fr= 1/2π√LC (Put the value of Inductor and Capacitor)
Fr =? (Find Resonance Frequency)

1. **Go to the Electromeet Lab and open Lab 4 Computer and then open NI-ELVISsmx.**



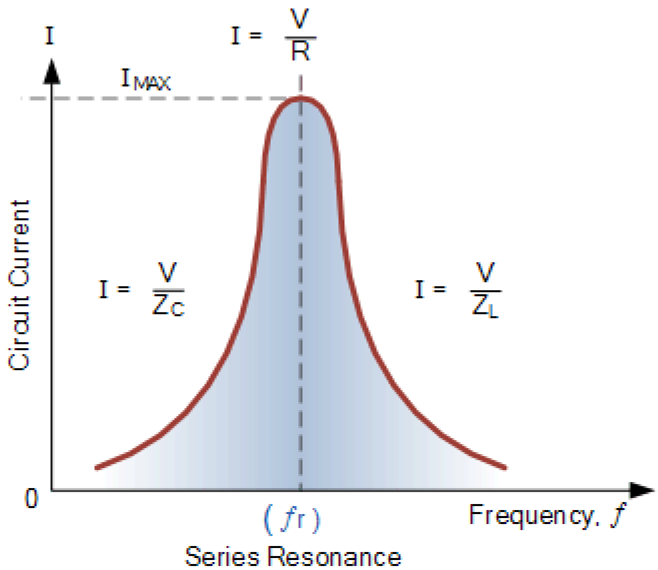
2. **Open Function Generator, Oscilloscope and Digital millimeter**



Instead "Immidiate" put "Edge" in Trigger Type for stable output reading in Oscilloscope.

3. Now plot the graph between frequency vs rms current and find the resonance frequency graphycally. This way you can find the bandwidth as well Q point of ceratian sersie LCR circuits.

Frequency(Hz)	700	720	740	760	780	800	820	840	860	880	900	920	940	960
Current(mA)														



4. The graph should look like this where you can find the resonant current value mathematically through voltage drop across inductor or capacitor during resonance divided by inductor or capacitor reactance.

5. Also bandwidth and quality factor can be calculated through the -3db calculation as well quality factor through series resistor. Please go through theory RLC material if needed more information.

6. Watch short video to learn how to operate RLC series resonance in Electromeet.

Thanks