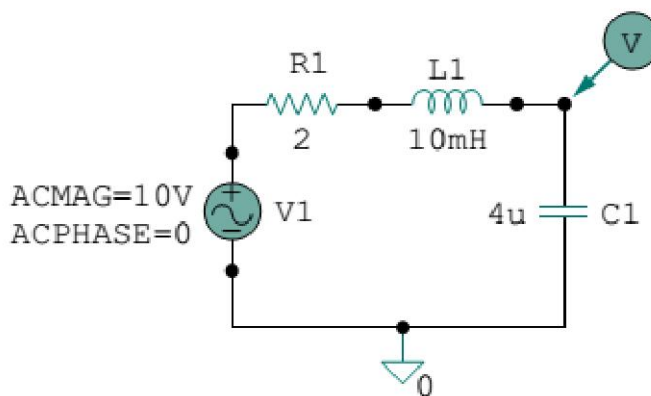


## Sheet (3)... Series Resonance using Proteus

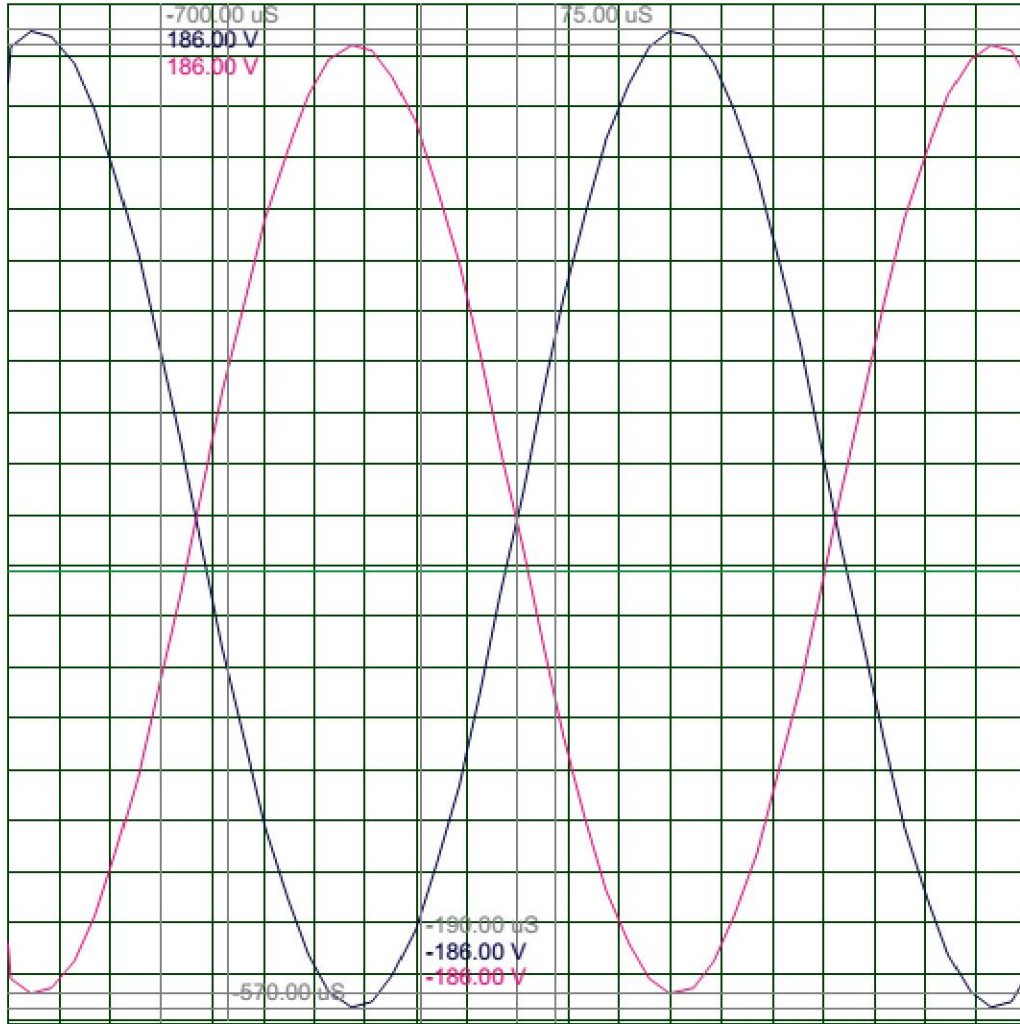
1. A series RLC is designed to resonant at  $\omega_s=10^5$ rad/s, have a bandwidth of  $0.15 \omega_s$ , and draw 16W from 120V source at resonance.
  - a. Determine the value of R.
  - b. Find the bandwidth in HZ.
  - c. Find the nameplate values of L and C.
  - d. Determine the Qs of the Circuit.

Ans. (a-900 $\Omega$ , b- 2387Hz, C- L=60mH & C=1.67nF, Qs=6.67)

2. For the shown RLC circuit in figure 1:
  - a. Calculate the resonance frequency, Quality factor, and Bandwidth.
  - b. Calculate the phasor voltages VL, and VC.
  - c. Using Proteus to Plot VL, and VC.
  - d. Using Proteus to Plot the frequency response for the capacitor (Magnitude of VC (in dB) with frequency).



Ans. (a-  $F_r=795.8$ Hz,  $Q=25$ ,  $B=200$ rad/s, b-  $V_L=250\angle 90$ ,  $V_C=250\angle -90$ )



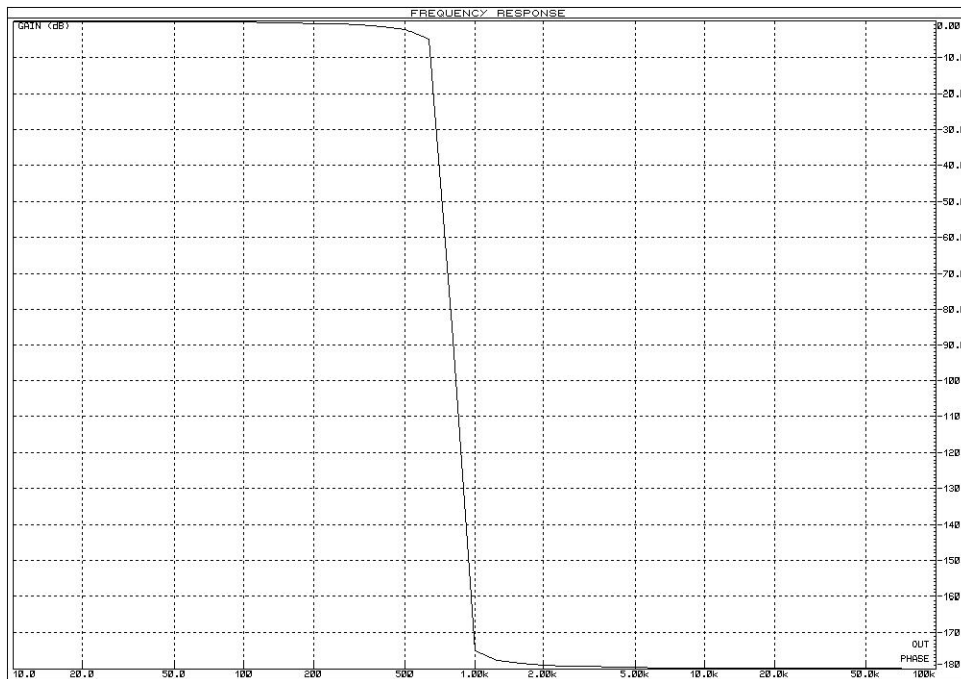
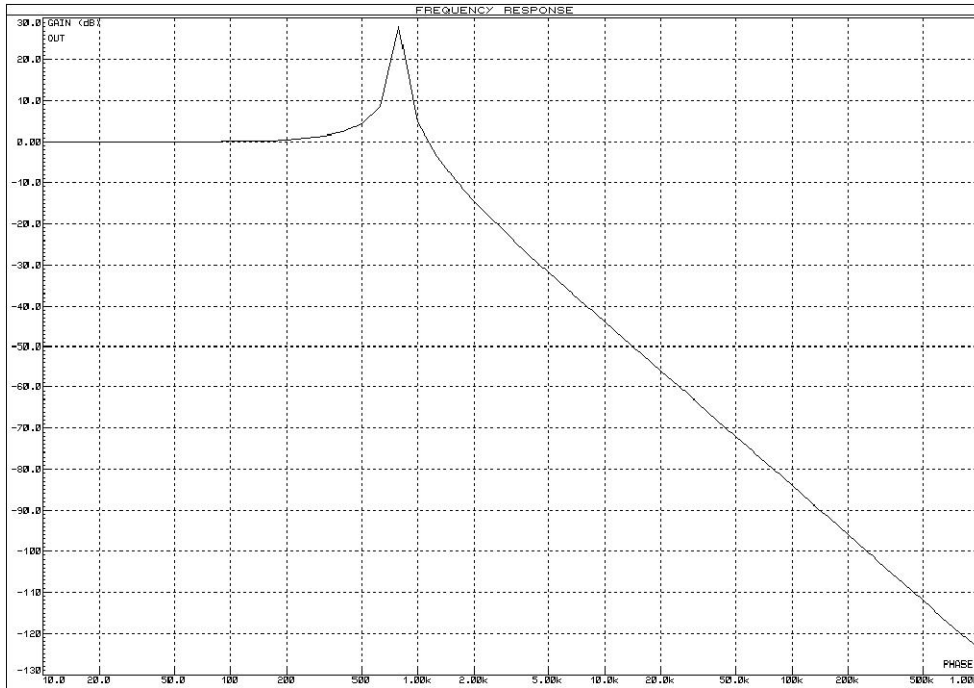
	Channel A	Channel B	Channel C	Channel D
V/Div	20.00 V	10.00 V	20.00 V	20.00 V
Offset	-4.00 V	40.00 V	-4.00 V	-44.00 V
Invert	Normal	Inverted	Normal	Normal
Coupling	AC	AC	AC	AC
Source	Horizontal		Trigger	
Position	Trace		Source	Channel A
S/Div	1.00 mS		Level	0.00 V
	100.00 uS		Coupling	DC
			Edge	Rising
			Mode	Auto



Benha University  
Faculty of Engineering  
Shoubra

Electrical Circuits (2)

Electrical Eng. Dept.  
1<sup>st</sup> year communication  
8-10 March 2015



*Good Luck*

*Dr. Basem ElHalawany*