**LAB 6 20-21.03.2019**

 **ECE 232** –**ADVANCED ELECTRICAL CIRCUIT ANALYSIS +LAB**

  **FREQUENCY RESPONSE (PHASE,MAGNITUDE CHARACTERISTICS)**

**Q-1)**

**a-)** Determine the differential equation for the given circuit in below .

**----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**b-)** What is the resonance frequency for the given circuit in below?

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**c-)** Determine the Transfer Function for the given circuit.

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**d-)**For the same circuit , find the magnitude of $H\left(jw\right)=\frac{V\_{out}(jw)}{V\_{in}(jw)}$ , ‘’f ‘’ is the resonance frequency

***For f=100 Hz*  =\_\_\_\_\_\_\_**

***For f=resonance frequency*=\_\_\_\_\_\_**

***For f=1000 Hz*=\_\_\_\_\_\_\_**

**d)** Find the phase of$H\left(jw\right)=\frac{V\_{out}(jw)}{V\_{in}(jw)}$ **;**

***For f=100 Hz* =\_\_\_\_\_\_\_**

***For f=resonance frequency* =\_\_\_\_\_**

***For f=1000 Hz* =\_\_\_\_\_\_\_**

**Q-2)**

Let$V\_{in}$ **=**$sin2πft $ **and L=0.1 H , C=10µF , R= 1kΩ .** Draw what you observe at the oscilloscope both at YT and XY format of the display menu of the oscilloscope.

****

***FIGURE 1:***

**a-)**

**f= 100 Hz (YT format)**

**CH1 (** $V\_{in}(jw)$ **: 500 mv**

**CH2(**$V\_{out}(jw)$**: 500 mv**

**Sec/div: 500 µs**

****

**b-)**

**f=100 Hz (XY format)**

**CH1 (** $V\_{in}(jw)$ **: 500 mv**

**CH2(**$V\_{out}(jw)$**: 500 mv**

**Sec/div: 500 µs**

****

***FIGURE 2:***

**a-)**

 **f=resonance frequency (XY FORMAT)**

**CH1 (** $V\_{in}(jw)$ **: 2 V**

**CH2(**$V\_{out}(jw)$**: 1 V**

**Sec/div: 2.50 ms**

****

**b-)**

**f=resonance frequency (YT FORMAT)**

**CH1 (** $V\_{in}(jw)$ **: 2 V**

**CH2(**$V\_{out}(jw)$**: 1 V**

**Sec/div: 2.50 ms**

****

***FIGURE 3:***

***a-)***

**f=1000 Hz (XY format)**

**CH1 (** $V\_{in}(jw)$ **: 2 V**

**CH2(**$V\_{out}(jw)$**: 1 V**

**Sec/div: 500 µs**

****

**b-)**

**f=1000 Hz (YT format)**

**CH1 (** $V\_{in}(jw)$ **: 2 V**

**CH2(**$V\_{out}(jw)$**: 1 V**

**Sec/div: 500 µs**

****