



**Electric Circuit Analysis**  
**Practical**

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**Lecture 1 and 2**

## EX NO 1: R L SERIES CIRCUIT

### 1-PURPOSE:

This experiment is to study the shape of current and voltage and the phase difference between them in R L series connection and study this value

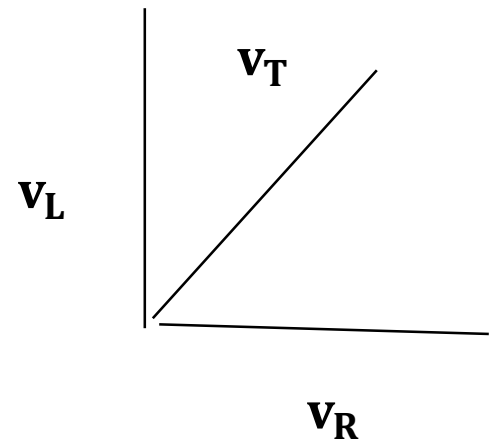
### 2- THEORY

The ideal coil make delay between current and voltage in phase of  $\pi/2$  and the resistance make the current and voltage in the same phase .

In the circuit that connection non ideal coil (i.e have resistance ) the delay of current w.r.t voltage will be in phase phase, which value depend on capacitor of xe for the capacitor and its resistance, and with calculated of this shape which is equal to:

$$\tan\phi = \frac{V_L}{V_R}$$

$$\phi = \tan^{-1} \frac{L}{R}$$



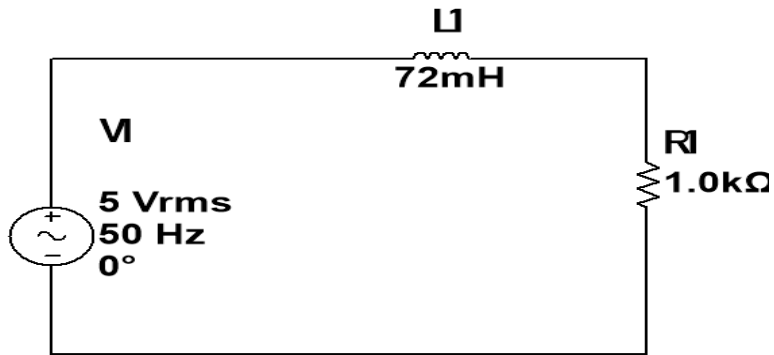


Fig 1

$$X_L = 2 \pi F L$$

Fig 2

### 3-PROCEDURE

- 1- Connection the circuit in the figure 2
- 2- Set the value of input voltage as 5 v p.p
- 3- Measure the voltage across resistance and inductor with the varying the frequency as shown in table below
- 4- Find the value  $X_L$

F(HZ)	$X_L$	$V_L$	Z	$V_R$	$\phi$

### 4 – DISCUSSION

- 1- Draw the relation between f and v for the  $V_R$  and  $V_L$  By using semi-log paper

- 2- Draw the relation between  $\phi$  and  $f$  after the calculation it
- 3- Discussion the curve

## **EXP.NO3: RC Series Circuit**

### **1-PURPOSE:**

This experiment is to study the shape of current and voltage and phase different between them in RC series connection and study these values.

### **2-THEORY:**

In RC series connection, the ideal capacitor makes delay between current and voltage in phase of  $\pi/2$  and the resistance makes the current and voltage in the same phase. In circuit that contain non-ideal capacitor (i.e. have resistance), the delay of voltage w.r.t current will be in phase, which value depend on capacitor of  $x_e$  for the capacitor and its resistance, and with calculated of this shape which is equal to

$$\tan\phi = \frac{V_C}{V_R}$$

$$X_C = \frac{1}{2\pi f C}$$

$$\phi = \tan^{-1} \frac{X_C}{R}$$

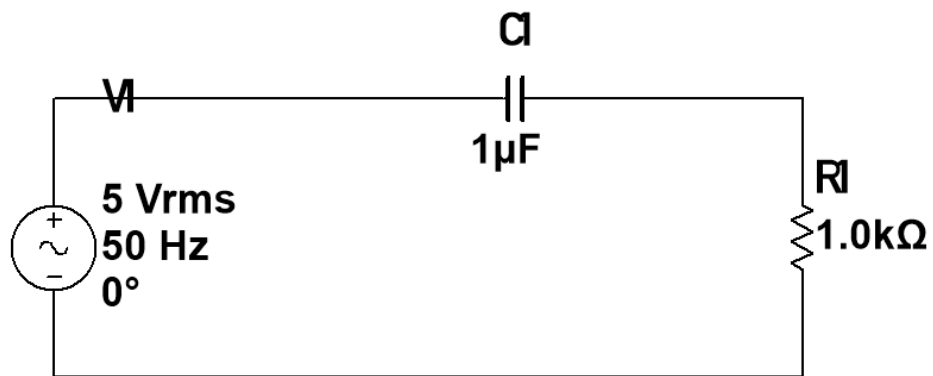


FIG 1

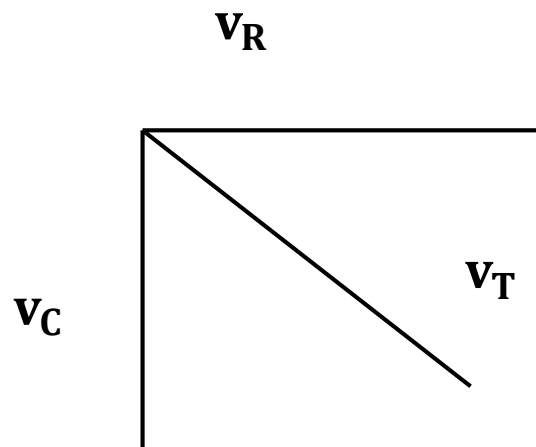


FIG 2

## 4-PROCEDURE

- 1-Connect the circuit in the figure (2).
- 2-Set the value of input voltage as 5V P.P.
- 3- Measure the voltage across the resistor and capacitor  
varying the frequency as shown in table.
- 4- Find the value of  $X_C$

F(HZ)	VR	VC	$X_C$	Z	$\phi$

## 5- DISSCUSSION

- 1- Draw relation between F and V for the each VR and VC on  
sime -hog paper
- 2- Draw relation between  $\phi$  and f after calculation it
- 3- Discuss the curves