TD N°2.2:*

Exercice N° 04

a- Consider an RL circuit whose effective current is I=1A. R=100Ω, L=38.6mH, f=50Hz. Determine the effective values U_R , U_L and U_t and the corresponding phase shift.
b- Consider an RC circuit whose effective current is I= 1A. R=100Ω, C=35µF, f=50Hz . Determine the effective values de U_R , U_C et U_t and the corresponding phase shift.

Exercice N° 05

A 25 Ω resistor, a 10 µF capacitor and a 0.1H inductor which has an internal resistance of 12 Ω are connected in series. Determine for a frequency of 50 Hz:
1. The coil impedance and the capacitor impedance.
2. The module of the overall circuit impedance.
3. What is the nature of the charge.
4. Calculate the effective current in the circuit for a sinusoidal voltage of maximum value 300 V.

Exercice N° 06

We consider the circuit represented in the figure where is the complex representation of a sinusoidal voltage with effective value V=100 V and frequency 50 Hz. The components of this circuit are directly characterized by the value of their complex impedance.
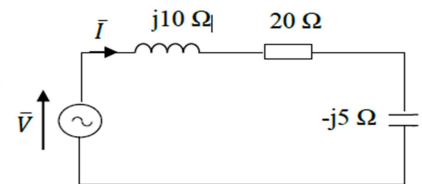**1.** Calculate the effective value I of the current.
2. Calculate the phase of the current if we consider the voltage at the origin of the phases. Then write the time expression for the voltage v(t) and the current i(t).
3. Represent all the complexes forming this mesh law on a vector diagram in the complex plane (Fresnel diagram).
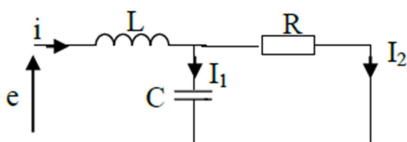

Figure 1

Exercice N° 07

Calculate the impedances of each branch and the equivalent impedance and the current i(t),
Knowing that V(t)= 220 $\sqrt{2}$sin314t.
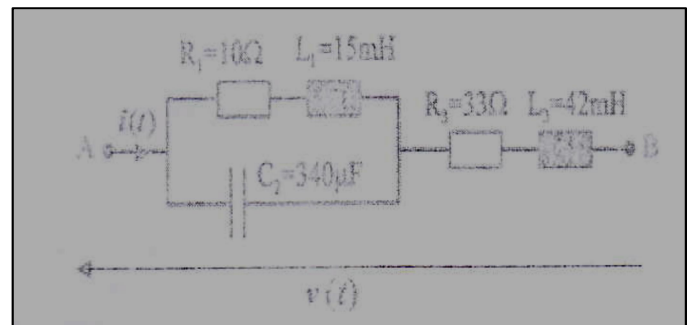
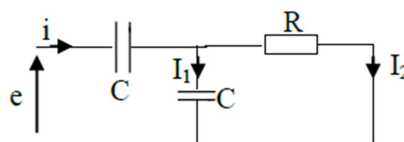### Exercice N° 08 (homework to do at home and return)
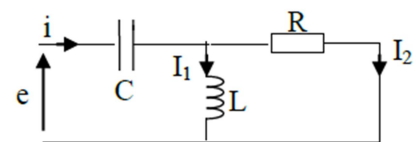
For the following three circuits, determine:
1. Their complex impedance.
2. Intensities i and i1
A. N For a sinusoidal voltage of maximum value 10 V ;R = 2Ω, C =10µF , L 5µH .

-A   -B   -C