A.C. circuit with inductance and resistance

Inductor

A coil of wire that generates a magnetic field when current is passed through it. The strength of the magnetic field is measured in Henrys (**H**). When the current is removed, as the magnetic field disintegrates, it "**induces**" a brief current in the opposite direction of the original. Thus, "**induction**" is caused by the opening and closing of a **DC** circuit or the continuous changing of directions in an **AC** circuit.

1
2
3
2 METER

Inductor is an electric device consisting of one or more turns of wire and typically having **two** terminals. An **inductor** is usually connected into a circuit in order to raise the **inductance** to a desired value.

An **inductor** is a passive electrical device that stores energy in a magnetic field, typically by combining the effects of many loops of electric current.

Inductance

The **inductor's inductance** (***L***) is the measurement of the percentage between the inductive electromotive force in inductance (**e.m.f.**) and the time average of the current change (***ΔI/Δt***) that flow through it: -

$$L = -\frac{e.m.f.}{\Delta I / \Delta t}$$

In **SI** units is **Henry**, Since the **Henry** is a very large unit, values of **inductors** are usually expressed in microhenrys (**μH**), nanohenrys (**nH**) or picohenrys (**pH**).

In D.C. Circuit. → Coil acts as resistance.

In A.C. Circuit. → Coil acts as impedance

Inductive Reactance

Inductive reactance is defined as: -

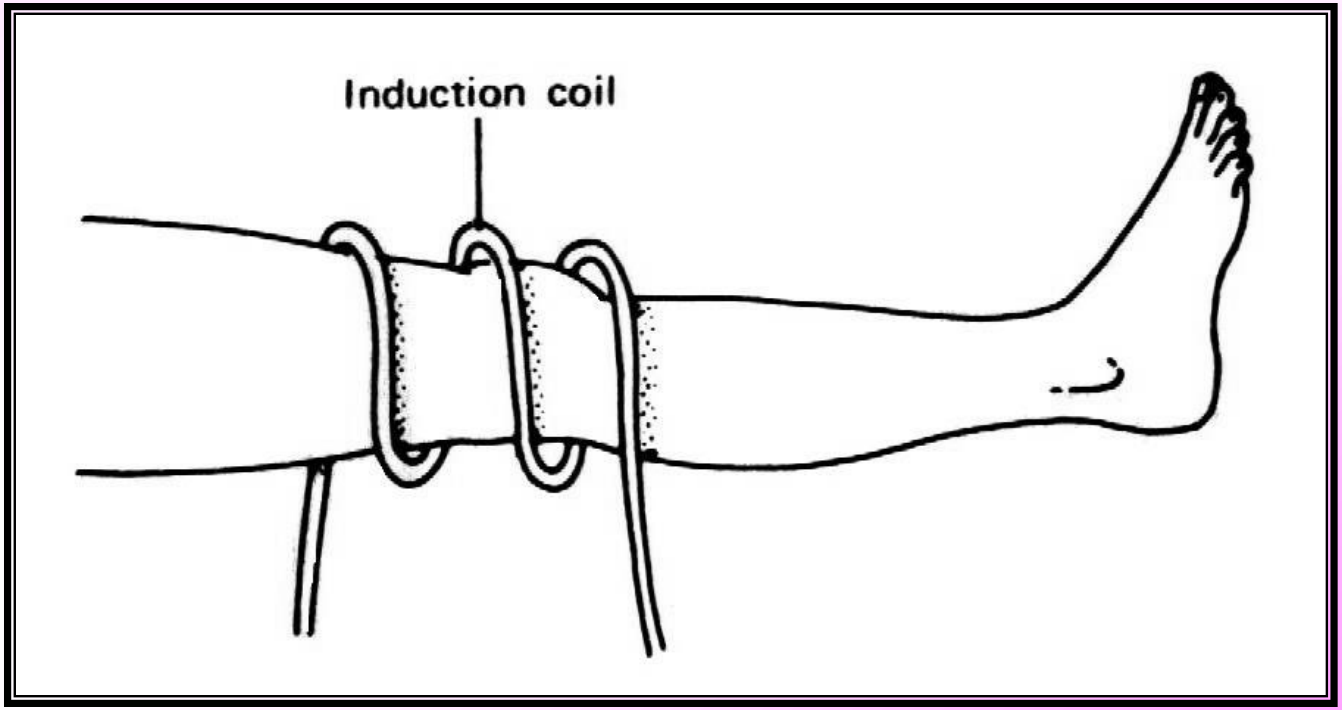
$$X_L = 2\pi f L$$

Where X_L is the **inductive reactance** in **Ohm**, ***f*** is the **frequency** in **Hertz**, and ***L*** is the **inductance** in **Henrys**.

The Medical Applications of Inductance

1. In inductance method of short-wave diathermy: -

It is considered one of the methods that are used for transferring the electromagnetic energy into the body in short-wave diathermy.



2. In micro engine: -

The sophisticated electronics of this dental laboratory unit, together with the rugged motor handpiece, guarantee a wide range of application in dental technology.