Subject Name : Basic Electronics

Subject Code : 66811

Department :Electrical

Semester: 1st

Teachers Name : Mohammad Sarowar Hossen

RESISTOR CAPACITOR INDUCTOR

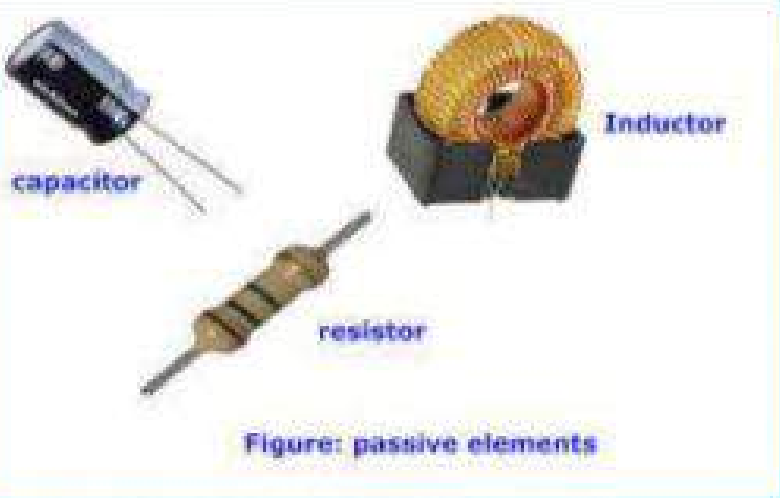

Figure: passive elements

PRESENTED BY - MANISH KUMAR

RESISTOR

By V.Ryan

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WHAT IS RESISTOR ??

- A RESISTOR IS A PASSIVE TWO-TERMINAL ELECTRICAL COMPONENT THAT IMPLEMENTS ELECTRICAL RESISTANCE AS A CIRCUIT ELEMENT.

- THE RATIO OF THE VOLTAGE APPLIED ACROSS ARESISTOR'S TERMINALS TO THE INTENSITY OF CURRENT THROUGH THE CIRCUIT IS CALLED RESISTANCE.

- THIS RELATION IS REPRESENTED BY OHM'S LAW:

$$V = I R$$

UNIT & SYMBOL

- THE OHM (SYMBOL: Ω) IS THE SI UNIT OF ELECTRICAL RESISTANCE, NAMED AFTER GEORG SIMON OHM.

- AN OHM IS EQUIVALENT TO A VOLT PER AMPERE

- OTHER DERIVED UNITS ARE MILLI OHM (1 MΩ = 10^{-3} Ω), KILO OHM (1 KΩ = 10^{3} Ω), AND MEGA OHM (1 MΩ = 10^{6} Ω).

FIXED RESISTOR

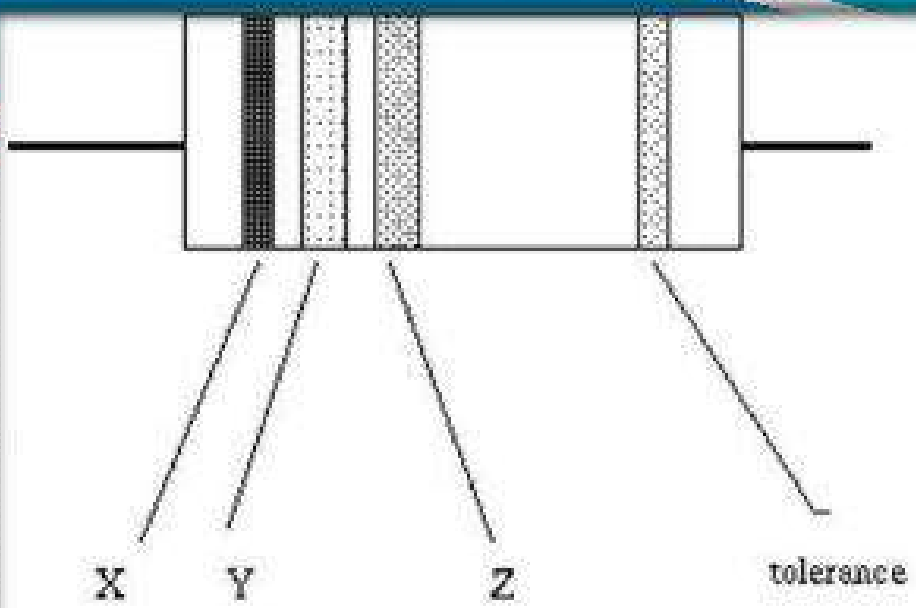
VARIABLE RESISTOR

FIXED RESISTOR

- CARBON COMPOSITE RESISTOR
- FILM RESISTOR
- WIRE WOUND RESISTOR
- RESISTANCE WIRE

VARIABLE RESISTOR

- RHEOSTAT
- POTENTIOMETER
- THERMISTOR
- HUMISTOR
- VARISTOR
- PHOTORESISTOR



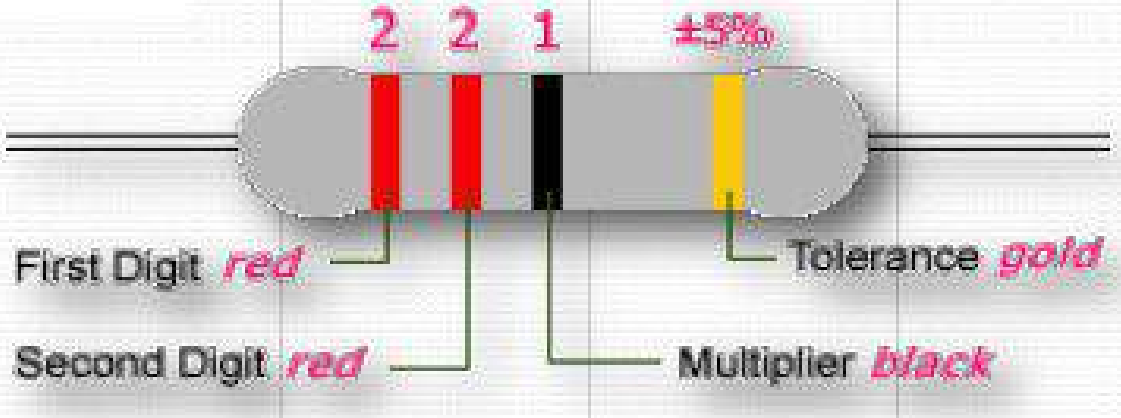
color code

0 black	5 green
1 brown	6 blue
2 red	7 purple
3 orange	8 grey
4 yellow	9 white

RESISTOR VALUE = XY * Z± TOLERANCE

EXAMPLE:-

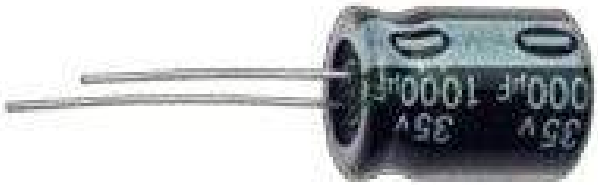
FIND THE RESISTANCE OF THE GIVEN RESISTOR ?

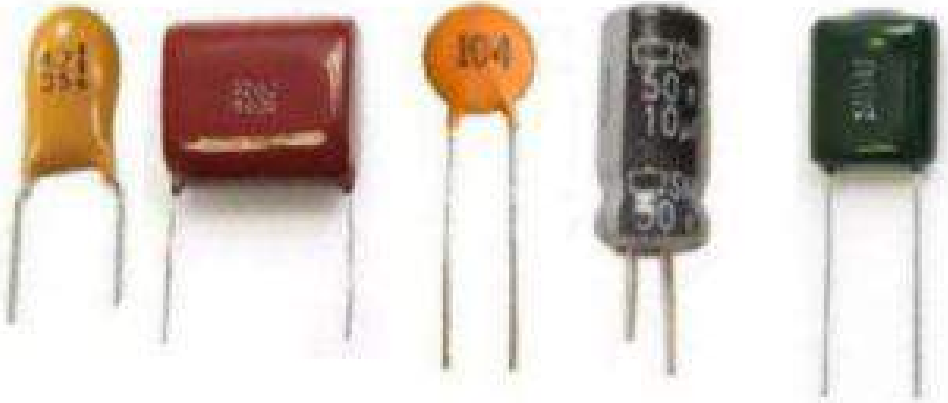


A 22Ω Resistor
22×1 Ohms with a tolerance rating of ±5%

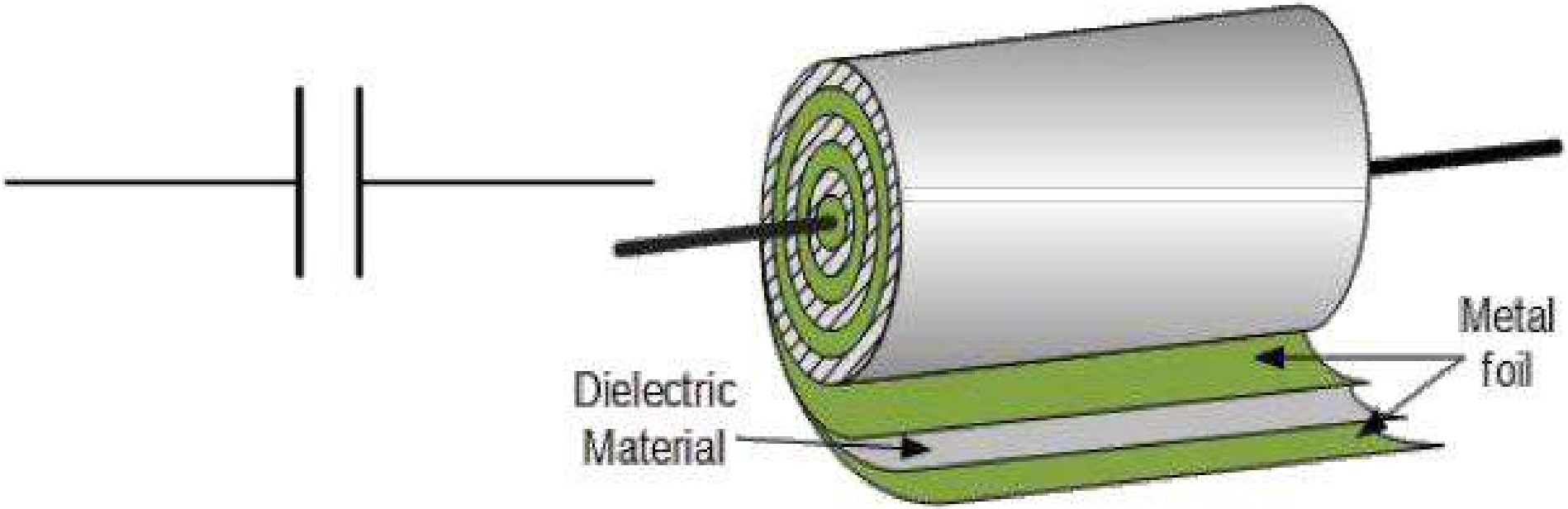
COLOUR CODE TABLE

COLOUR	DIGIT	MULTIPLIER	TOLERANCE
BLACK	0	10^0	-
BROWN	1	10^1	± 1%
RED	2	10^2	± 2%
ORANGE	3	10^3	-
YELLOW	4	10^4	-
GREEN	5	10^5	± 0.5%
BLUE	6	10^6	± 0.25%
VIOLET	7	10^7	± 0.1%
GREY	8	10^8	-
WHITE	9	10^9	-
GOLD	-	10^{-1}	± 5%
SILVER	-	10^{-2}	± 10%
NONE	-	-	± 15%





CAPACITOR



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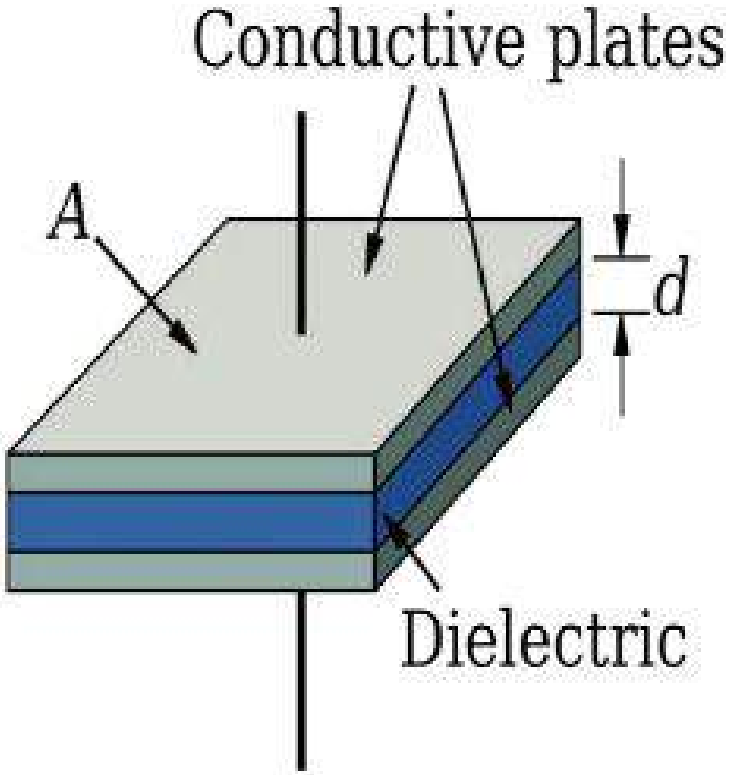
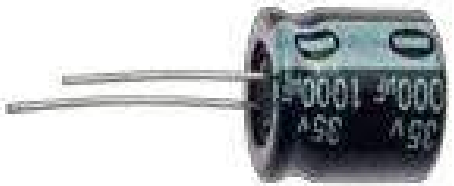
What is the capacitor?

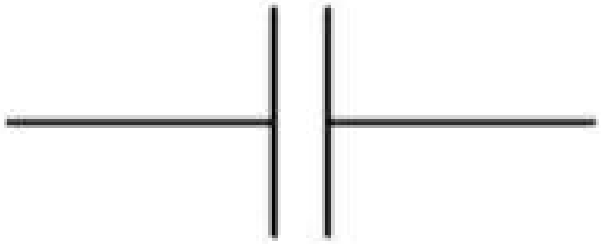
The capacitor is passive device consists of tow plats and separated by an insulator material.



Reason for use the capacitor in the circuit is a **storage the energy.**

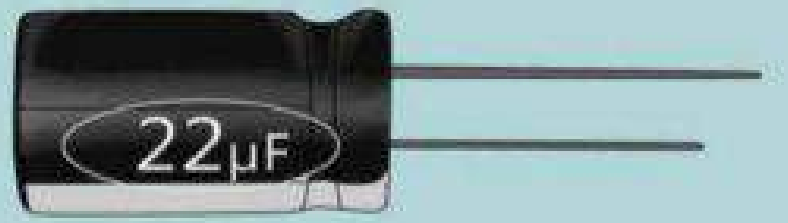


The Symbol of Capacitor



The Unity of Measurement The Capacitor

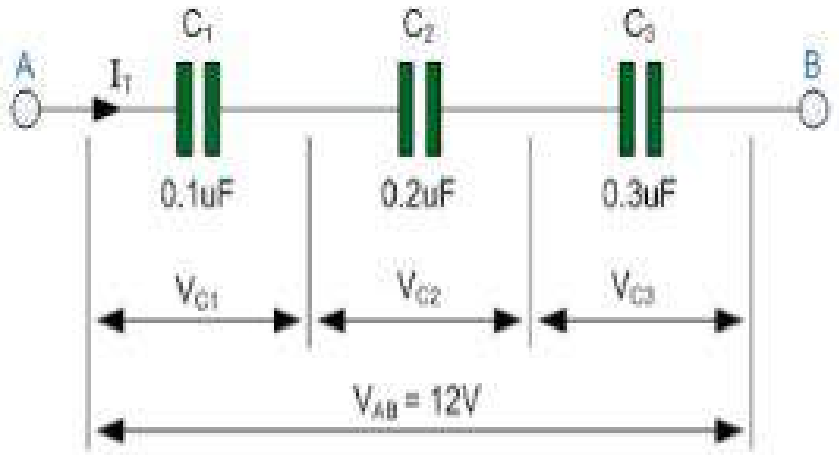
farad (F)

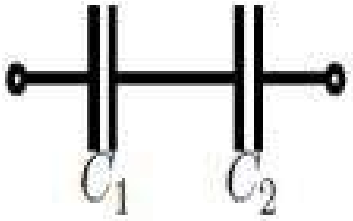


µF uF mF	MICROFARAD	10^{-6}F
nF	NANOFARAD	10^{-9}F
pF mmf uuf	PICOFARAD	10^{-12}F

Connection of capacitor in series

- Equivalent Gault
- Formula
- Examples

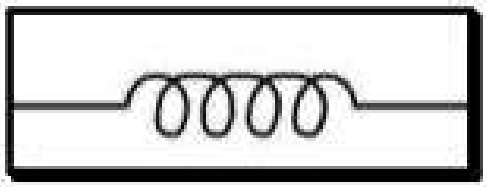


SERIES		$\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2}$

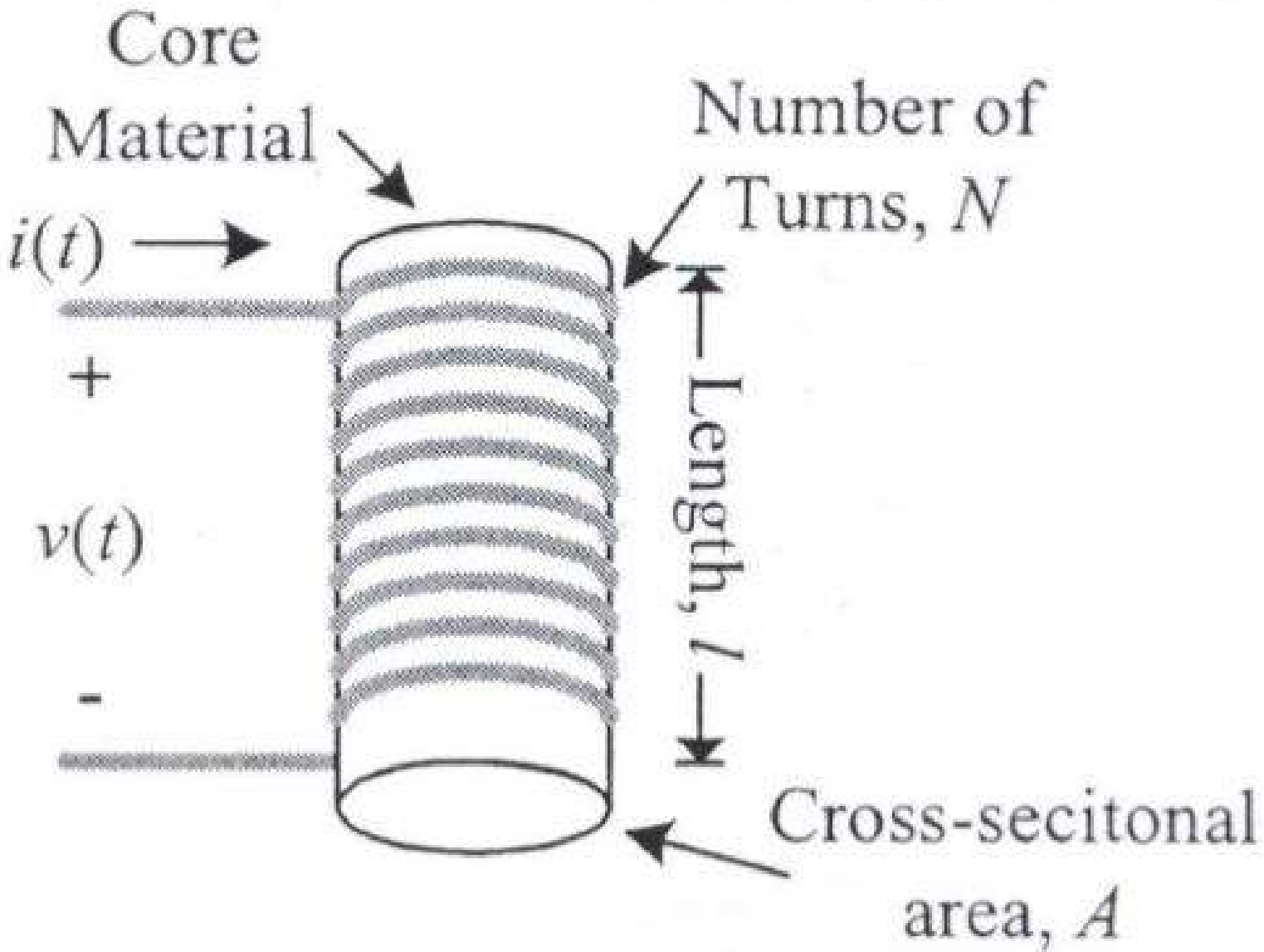
Inductor

Inductors

- ***Definition: An inductor is a passive electronic component that stores energy in the form of a magnetic field.***
- In its simplest form, an inductor consists of a wire loop or coil. The inductance is directly proportional to the number of turns in the coil.
- Inductance also depends on the radius of the coil and on the type of material around which the coil is wound.

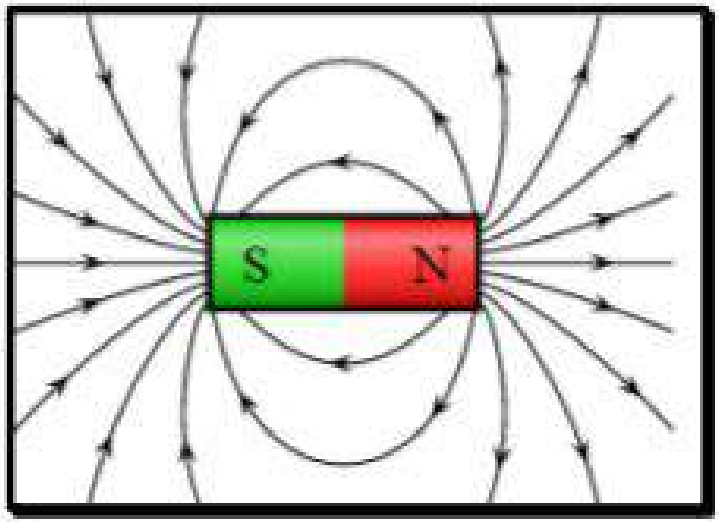


Inductor


Core
Material
Number of
Turns, N
i(t)
+
v(t)
-
Length, l
Cross-secitonal
area, A

Magnetism

- Any material possessing the property of magnetism is a magnet.
- Every magnet has both a north (N) pole and a south (S) pole.
- Just as "like" electric charges repel each other and "unlike" charges attract, "like" magnetic poles repel each other and "unlike" poles attract.




Thank
you