February 17th -23 — :- Physics :- — Friday

Syed Irfan.

Columb's law	Newton's law
$F \propto \frac{q_1 q_2}{r^2}$	$F \propto \frac{m_1 m_2}{r^2}$
$F = \frac{k\, q_1 q_2}{r^2}$	$F = G \frac{m_1 m_2}{r^2}$
$= \frac{1}{4\pi\varepsilon_0} \times \frac{q_1 q_2}{r^2}$	$F = G \frac{m_1 m_2}{r^2}$
$k = 8.99 \times 10^9\ Nm^2/c^2$	$k = \frac{1}{4\pi\varepsilon_0}$

ε_0 = permittivity — +, −

↓

★ The property of the material/object, that indicates, how much electric field can pass through it.

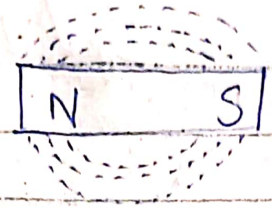
★ The number of charges passing through a body is also known as permittivity.

M_0 = permittivity

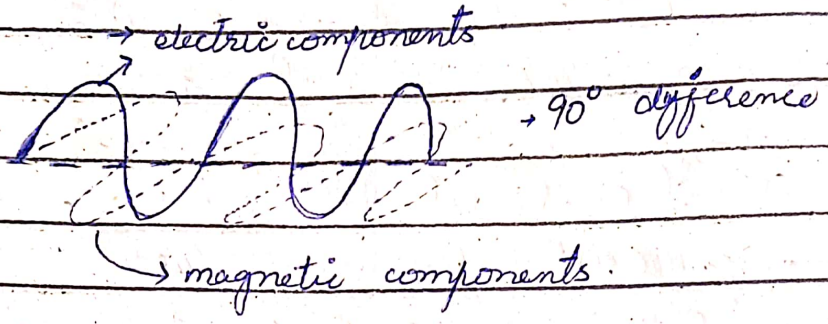
↓

The property of a material that indicates, how much magnetic fields can pass through it.

→ electric field lines

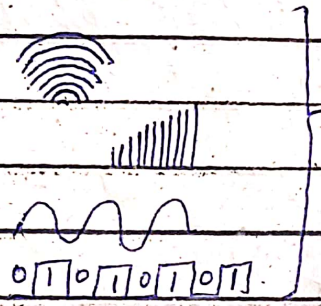


* Electro-magnetic

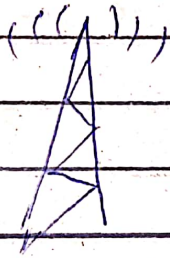


(i) Sound waves

(ii) Radio waves (cellular-waves, wi-fi, Bluetooth)
signals Radio, Tv



Signals : Signals are the information



cellular
- 1800 MHz
- 1900 MHz
- 800 "
- 900 "
- 2200 "

* $q_1 = 1.37 \times 10^5 C$

$q_2 = 1.37 \times 10^5 C$

$r = 100 m$

$k = 8.99 \times 10^9 \ Nm^2/C^2$

$$F = k \frac{q_1 q_2}{r^2}$$

$$F = (8.99 \times 10^9)(1.37 \times 10^5)(1.37 \times 10^5)$$
$$(100)^2$$

$$F = \frac{8.99 \times 10^9 \times 1.8769 \times 10^{10}}{(100)^2}$$

$$F = \frac{1.6873 \times 10^{20}}{10,000}$$

$$\boxed{F = 1.6873 \times 10^{16}} \quad \text{Ans}$$

* $r = 5.3 \times 10^{-11} m$

$q_1 = q_2 = 1.6 \times 10^{-19} C$

$$F \propto \frac{q_1 q_2}{r^2}$$

$$F = \frac{k q_1 q_2}{r^2}$$

$$F = \frac{(8.99 \times 10^9) \times (1.6 \times 10^{-19})(1.6 \times 10^{-19})}{(5.3 \times 10^{-11})^2}$$

$$F = \frac{(8.99 \times 10^9)(2.56 \times 10^{-38})}{2.809 \times 10^{-21}}$$

$$F = \frac{2.30144 \times 10^{-28}}{2.809 \times 10^{-21}}$$

$F = 8.19 \times 10^{-8}$

neutral coin, $m = 3.11$ gram.

↳ copper, 29

$z = 29$

$$N = N_A \frac{m}{M}$$

$$= 6.02 \times 10^{23} \text{ atom/mol} \cdot \frac{3.11 \text{ gram}}{63.5 \text{ gram/mole}}$$

= no. of moles in copper is

$$\frac{m}{M}$$

M = molar mass...

$= 63.58$/mole

$= 2.95 \times 10^{22}$ atoms

$q = NZe$

$q = 2.95 \times 10^{22} \text{ atom} \times 29 \times 1.6 \times 10^{-19} \text{ C}$

$q = 137000 \text{ C}$

$q = 1.37 \times 10^5 \text{ C}$ Total charge.