# Chapter-02
## Solutions

| Types of solution | Solute | Solvent | Common Examples. |
|---|---|---|---|
| Gaseous solution | Gas | Gas | Mixture of $O_2$ & Nitrogen gas. |
| | liquid | Gas | Chlorofoam mixed with $N_2$. |
| | Solid | Gas | Camphor in $N_2$ |
| Liquid solution | Gas | liquid | $O_2$ dissolved in water |
| | liquid | liquid | Ethanol in water. |
| | Solid | liquid | Glucose in water |
| Solid | Gas | Solid | Solution of Hydrogen in Palladium |
| | Liquid | Solid | Amalgam of mercury with Sodium |
| | Solid | solid | Copper dissolved in gold. |

# Concentration Terms.

Solute + Solvent = Solution
(B) (A) (A+B)

There are several ways by which we can calculate the concentration.

(2) $\boxed{\%\ \frac{w}{v} = \frac{w_B}{v_{soln}} \times 100}$ # Temp. dependent

# Volume by Volume percentage...

x % $\frac{v}{v}$ ethanol

⇒ x ml ethanol is present in 100 ml soln.

[42.8 % $\frac{v}{v}$ ethanol]

42.8 ml ethanol is present in 100 ml soln.

$v_B$ = 42.8 ml $v_{soln}$ = 100 ml

$\boxed{\%\ \frac{v}{v} = \frac{v_B\ (ml)}{v_{soln}\ (ml)} \times 100}$ # Temp. dependent

# Strength of Solution.

30 % → 30 % $\frac{w}{w}$ or 30 % by weight

30 % → 30 % $\frac{w}{v}$

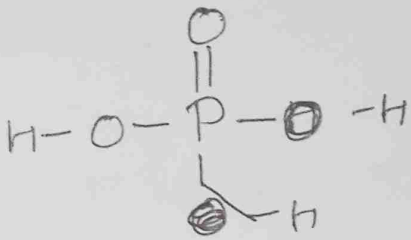
30 % → 30 % $\frac{v}{v}$

★ n. factor or x-factor or valence factor.

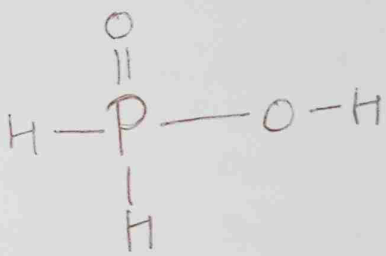
Case-I

for Acids :- no. of ionisable $H^+$ ions.

| | n.f. |
|---|---|
| $HCl \longrightarrow$ | 1 |
| $H_2SO_4 \longrightarrow$ | 2 |
| $H_3PO_4 \longrightarrow$ | 3 |
| $H_3PO_3 \longrightarrow$ | 2 |



| | |
|---|---|
| $H_3PO_2 \longrightarrow$ | 1 |



$H_3BO_3 \longrightarrow$

Case-II

for Base :- no. of $OH^-$ ions furnished.

| | n.f. |
|---|---|
| $MOH \longrightarrow$ | 1 |
| $M(OH)_2 \longrightarrow$ | 2 |
| $Al(OH)_3 \longrightarrow$ | 3 |

Case-III

for Salts :-

Total +ve charge or Total -ve charge.

| | $\frac{n.f.}{}$ |
|---|---|
| $Na^+Cl^- \longrightarrow$ | 1 |
| $Ca^{2+}Cl_2^- \longrightarrow$ | 2 |
| $Al^{3+}Cl_3^- \longrightarrow$ | 3 |

making one body positively charged and the other negatively charged.

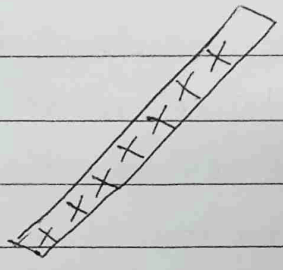
## ★ Charging by conduction :-

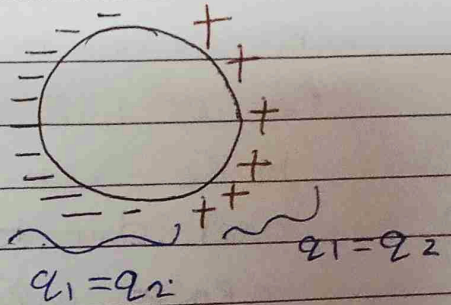
conduction from a charged body involves transfer of like charges. A positively charged body can cause more bodies to get positively charged. But the sum of the total charge on all positively charged bodies will be as same as the charge on initially considered charged body.

If shape, size, material of both conductor is same, $q_1 = q_2$.

## ★ Charging by Induction :-

Induction is a ~~charge~~ process by which a charged body can be used to create other charged bodies without touching them or losing its own charge.






Note :- Rod does not loose any charge. Now, the rod is also removed. Negative charge spreads uniformly on the body.

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Q2) Charge on $\alpha$- Particle is :-

Sol:- As $\alpha$- Particle = 2 x Charge on proton.

$$= 2 \times 1.6 \times 10^{-19}$$

$$\boxed{= 3.2 \times 10^{-19} \text{ C.}}$$

Q3) A body has -80 micro column of charge Number of additional electrons in it will be:-

Sol:- $Q = ne$

$$-80 \times 10^{-6} = n \times -1.6 \times 10^{-19}$$

$$\frac{5 \times 10^{-6}}{10 \times 10^{20}}$$

$$\Rightarrow \boxed{n = 5 \times 10^{14}}$$

Q4) When a glass rod is rubbed with silk, it

Sol:- (b) Gives $e^-$ to the silk.

**Note:-** Transfer of charge $\longrightarrow$ Transfer of mass.

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# Chapter-2
## Sexual Reproduction in Flowering plant.

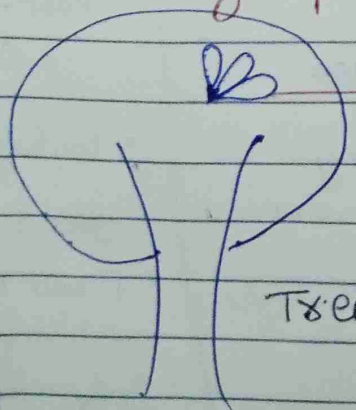
# Introduction

Plant → Gametophyte (Haploid) → Give gamete
Plant → Sporophyte (Diploid) —meiosis→ Spore form

- Algae
- Bryophyte
- Pteridophyte
  — Haploid
- Gymnosperm
- Angiosperm
  — Diploid

Gametophyte (n) —Mitosis→ gametes (+)
Sporophyte —meiosis→ spore (+)

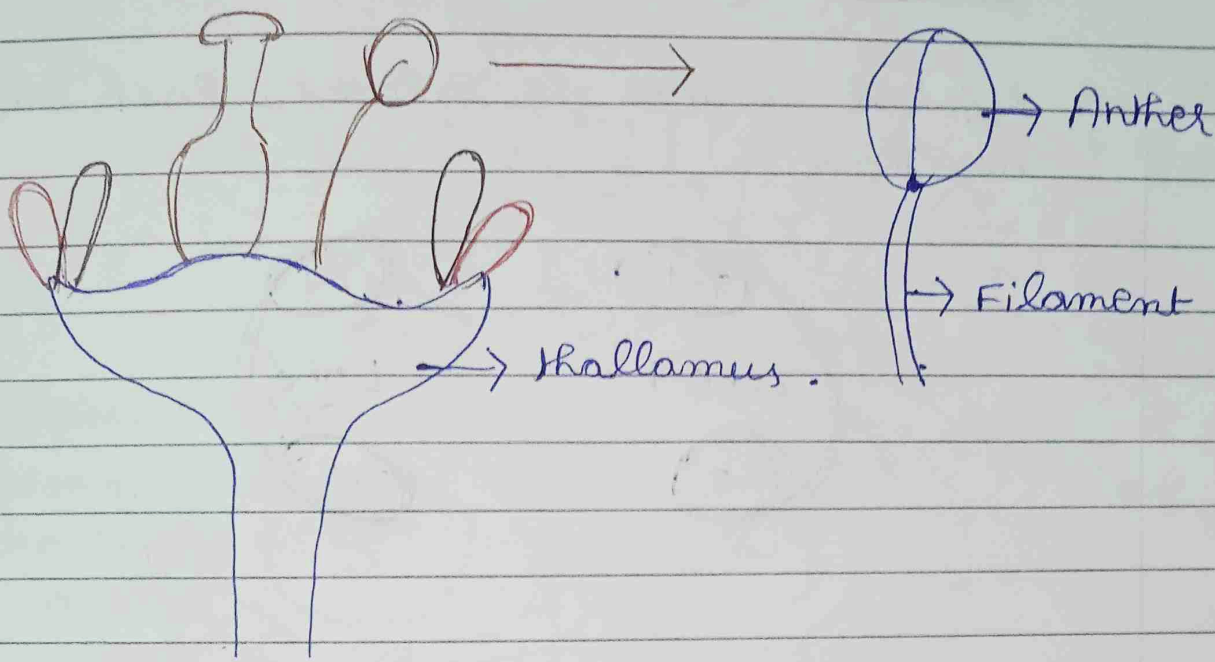
# Flowering plants → Meaning is Angiosperm

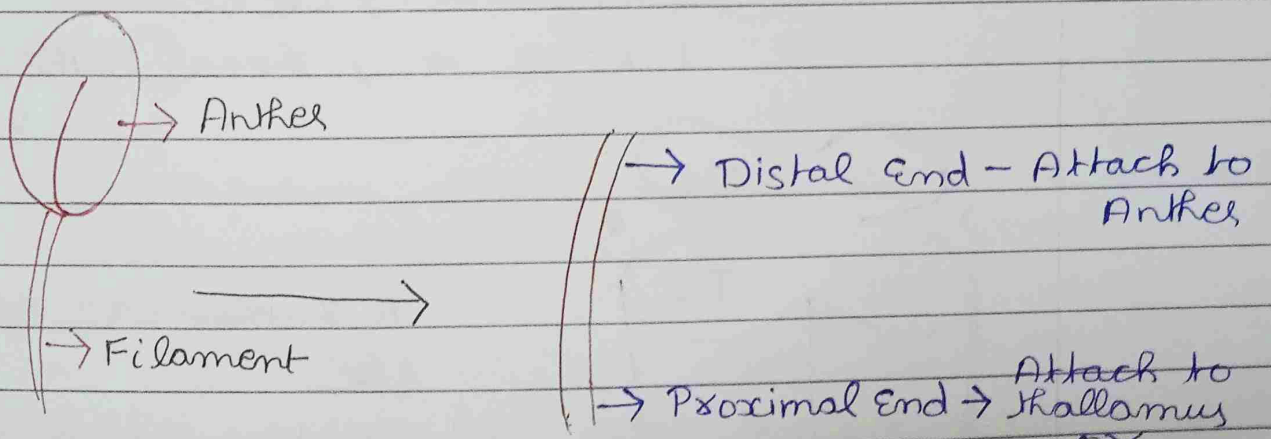


→ Flower (2n)
Tree = Sporophyte.

Main Stage Sporophyte
↓
Spore

# Structure of Stamen –




① Filament [thin, slender], Some have unequal length.