Biochemistry :- It is the application of chemistry to the study of biological process at cellular and molecular level.
It investigates chemistry of living system.

- **Metabolism :-** Sum total of all chemical reactions occuring in living body

- **Organic molecules (Biomolecules) :-**
  - Associated with living things
  - Always contain Carbon (C)
  - Large molecules with covalent bonds

Carbohydrates :- CARBO + HYDRATE
(Carbon + H_2O (Hydrogen + Oxygen))

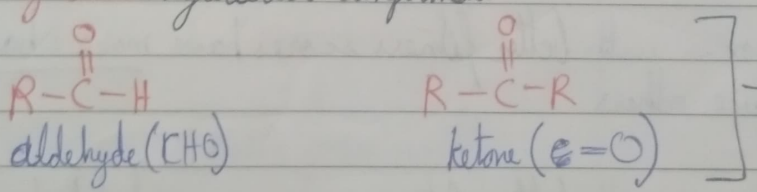
Carbohydrates are also called saccarides.
(derived from "sakcharon" means sugar)

General formula :- $C_n(H_2O)_n$ [n → whole no.]

Eg :- $n = 6$:- $C_6(H_2O)_6 = C_6H_{12}O_6$ [glucose/fructose]

- Carbohydrates are polyhydroxy aldehyde/ketone (or)

Their complexes give polyhydroxy aldehyde/ketone on hydrolysis ∴ They are hydrated compounds.



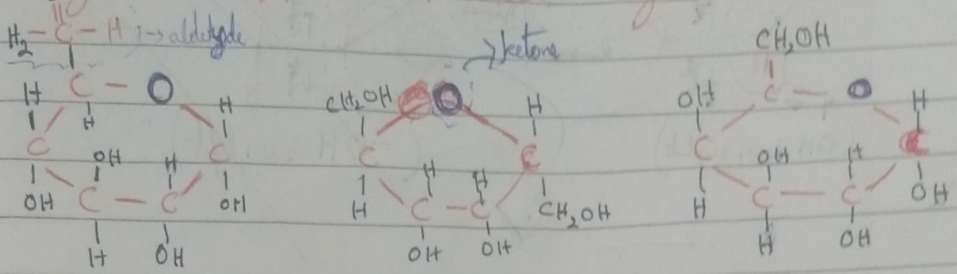
- **Exceptions :-** ① Some carbohydrates contain nitrogen, phosphorous, sulphur
② Some do not follow general formula. Eg :- Rhamnose ($C_6H_{12}O_5$)
③ Some who follow general formula are not carbohydrates
Eg :- formic, acetic & lactic acid

Characteristics :-
In general, carbohydrates are white solids, sparingly soluble in organic solvents except for certain polysaccharides, which are soluble in water.
Carbohydrates with low molecular weight are sweet in taste (sugar)

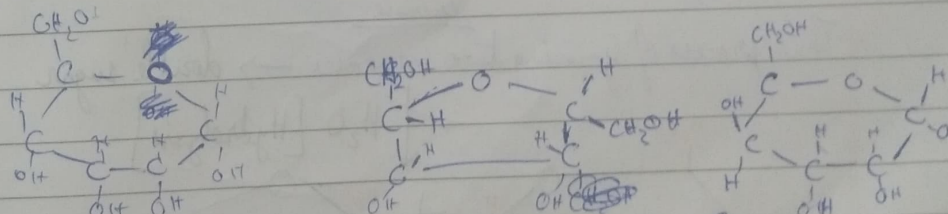
Classification of Carbohydrates:-

1) **Monosaccharides** :- (Also called cellular fuel that cells use for cellular work)
- Also called simple sugar
- It has 1 sugar molecule, hence it can't undergo hydrolysis
- Soluble in organic solvent

Eg:- Glucose, Fructose, Galactose

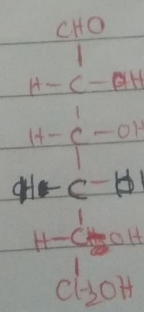


Here, Glucose & Fructose are functional isomers
Glucose & Galactose are Stereomers [Fisher projection]

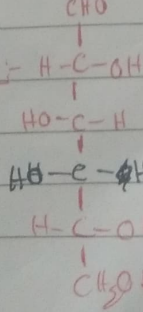


[5 C & 1 CH_2OH] [4 C & 2 CH_2OH] [Same as glucose but its stereoisomer]

Glucose:-



Galactose:-



flip 4th OH in left C