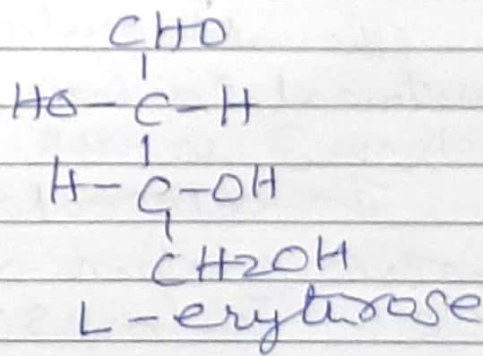
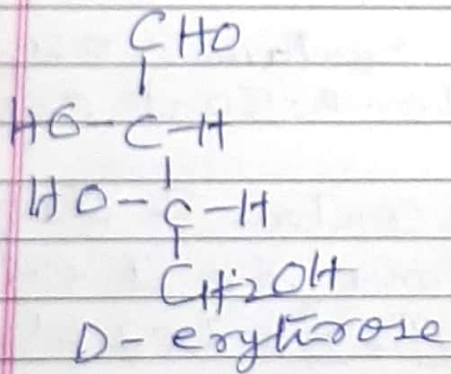
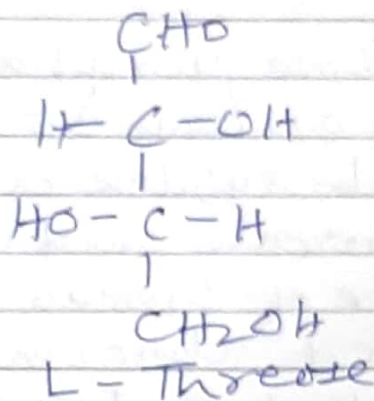
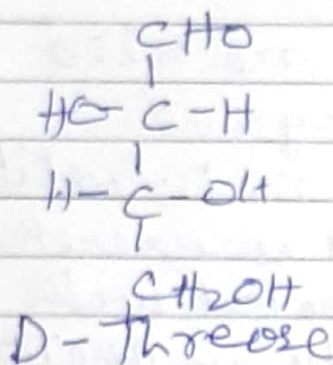


(ii) Tetrose:

It is monosaccharide containing 4 C-atom. The common tetrose occurring in organisms are erythrose and common ketotetrose is erythrulose.

Erythrulose appears in the form of its phosphate as an intermediate in several biochemical transformations.



Erythrose has two asymmetric carbon atoms at carbon atom number 2 and 3. So erythrose exists in ~~two~~ four isomers, namely D-erythrose, L-erythrose, D-threose, L-threose

(iii) Pentose: It is monosaccharide containing 5 carbon atoms. Its molecular

formula is $C_5H_{10}O_5$.

Pentose are important of nucleic acid. The biologically important pentose are ribose, deoxyribose, L-xylulose, xylose, ribulose, Pentosems, etc.

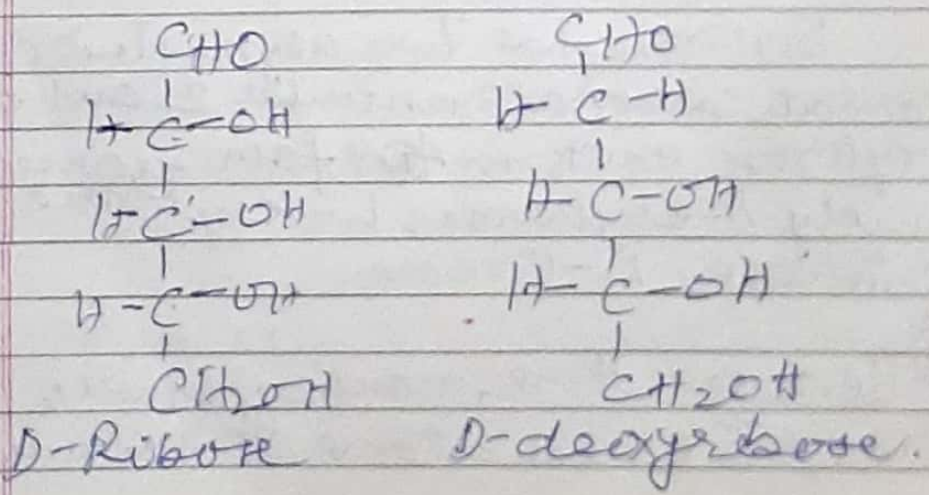
Ribose sugar occurs in RNA and deoxyribose sugars occurs in DNA.

Ribose phosphates are also a part of certain co-enzymes.

L-xylulose is a metabolite of gluconic acid and is excreted in the urine of human affected with an inherited abnormality in metabolism called pentosuria.

The aldopentose contain 3 asymmetric carbon atoms. So it can exist in 8 isomers.

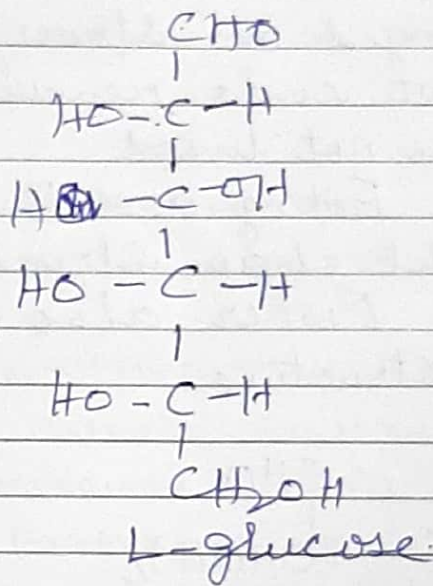
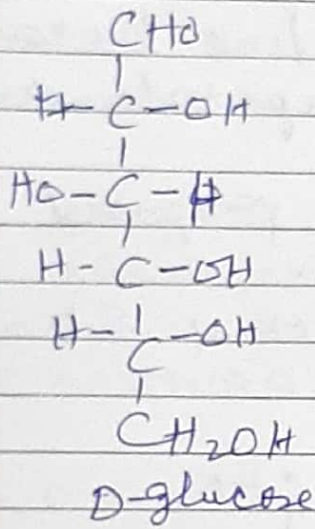
The ketopentose contain 2 asymmetric carbon atoms so it exists 4 isomeric forms ($2^n - 2^n = 2 \times 2 = 4$)



(iv) Hexoses:

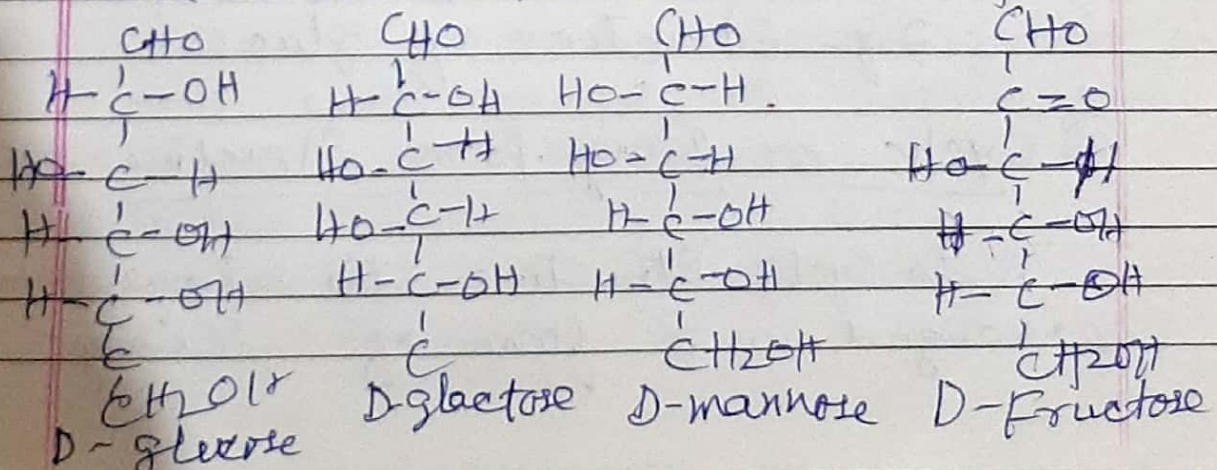
Hexoses are monosaccharides containing 6 C-atoms. Its molecular formula is $C_6H_{12}O_6$

Hexoses are biologically important sugars. The common hexoses are glucose, galactose, mannose and fructose.



The aldohexose contains 4 asymmetric C-atoms at position 2, 3, 4 & 5. Hence aldohexose exists in 16 isomeric forms.

The ketohexoses containing 3 asymmetric C-atoms at position 3, 4 and 5. So ketohexoses exist in 8 isomeric forms.



Structure of monosaccharides:

The monosaccharides may be represented by two structures

- ① Straight chain or open chain structure
- ② Cyclic structure or ring structure

① Straight chain structure:

In straight chain structure the, the 6 carbon atoms of glucose are arranged in straight line because the two ends remain separate and they are not linked.

Fitting and Baeyer proposed a straight chain structure.

Fisher also proposed straight chain structure.

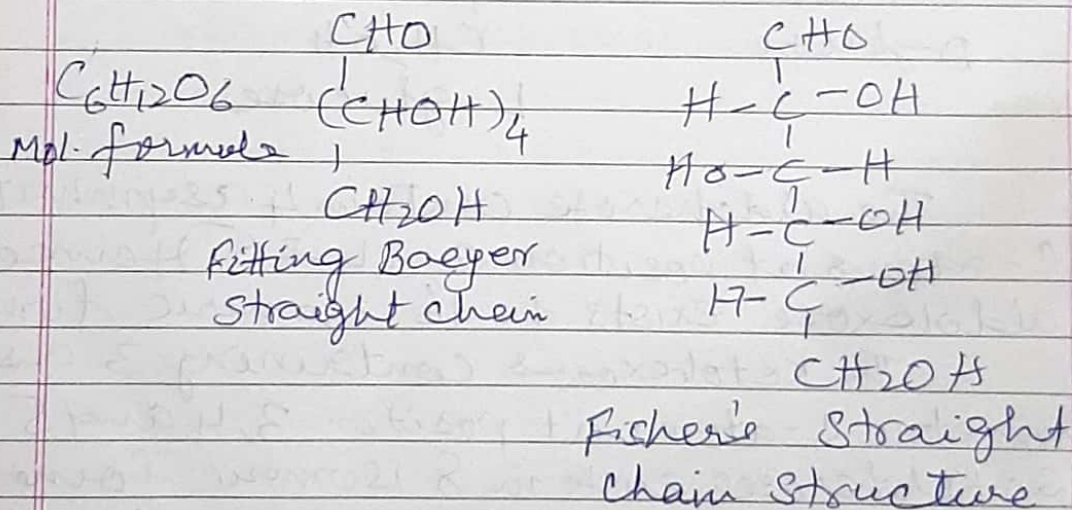


Fig- Structure of glucose.

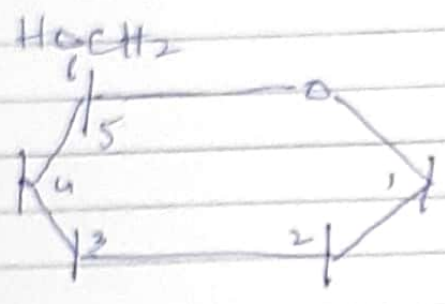
② Cyclic or Ring form Structure.

In cyclic structure, the atoms are arranged in a form of ring.

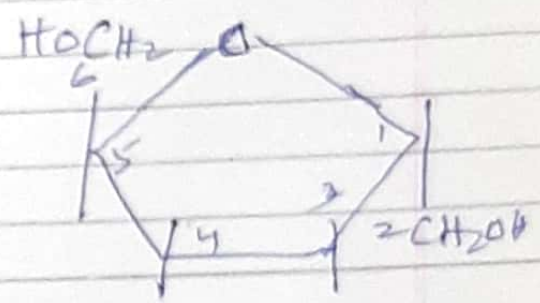
Howarth (1929) devised the ring structure. It is of two types -

- 1) Pyranose
- 2) Furanose

① Pyranose:
It is benzene 6 ring structure, in which 5-carbon atoms and one oxygen atom in the ring and the 6 C-atom lies outside the ring.



Pyranose



Furanose

② Furanose:-
It is five member ring in which 4 C-atoms lies within the ring and two carbon atoms lies outside the ring. There is one oxygen atom within the ring. The oxygen atom is called ring oxygen.

