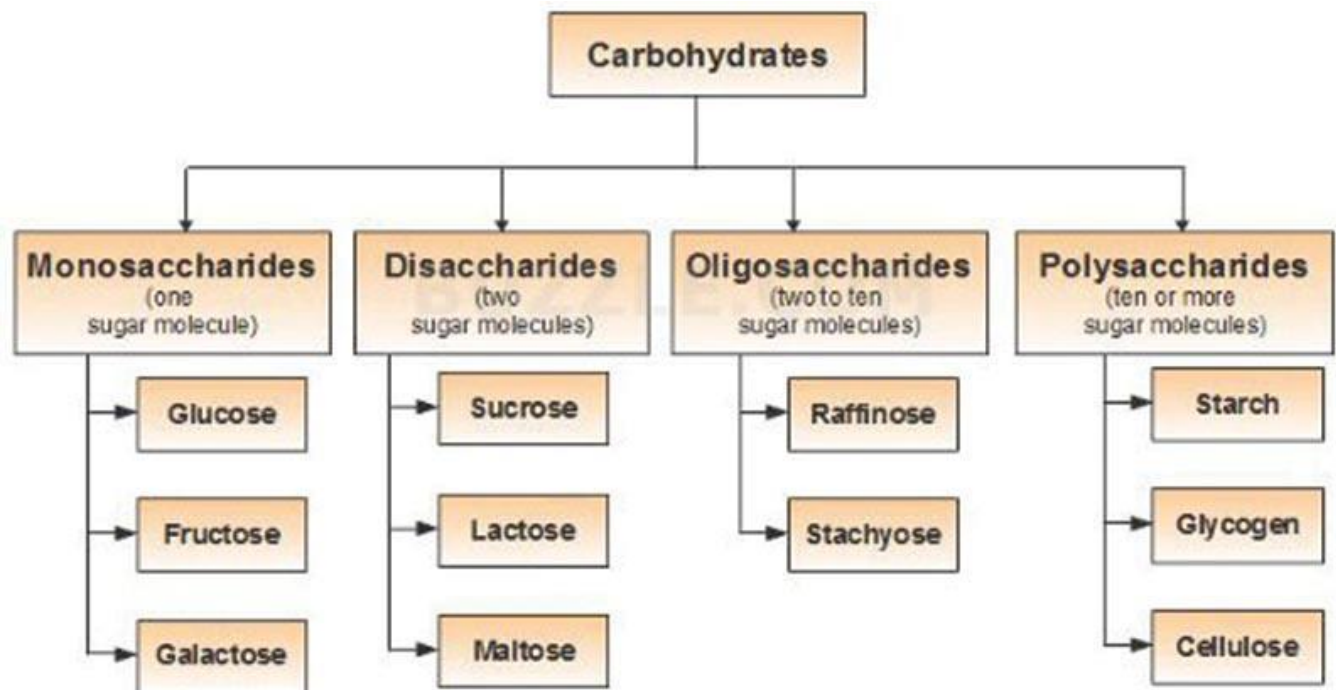


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Class: Deg.III(Hons.)
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Topic: Carbohydrate(contd.)
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Structure, Classification and Properties of Carbohydrate (Contd.):

Classification of Carbohydrate or Types of Carbohydrate:



The simple carbohydrates include single sugars (monosaccharides) and polymers, oligosaccharides, and polysaccharides.

Monosaccharides

- Simplest group of carbohydrates and often called simple sugars since they cannot be further hydrolyzed.
- Colorless, crystalline solid which are soluble in water and insoluble in a non-polar solvent.
- These are compound which possesses a free aldehyde or ketone group.
- The general formula is $C_n(H_2O)_n$ or $C_nH_{2n}O_n$.
- They are classified according to the number of carbon atoms they contain and also on the basis of the functional group present.
- The monosaccharides thus with 3,4,5,6,7... carbons are called trioses, tetroses, pentoses, hexoses, heptoses, etc., and also as aldoses or ketoses depending upon whether they contain aldehyde or ketone group.
- Examples: **Glucose, Fructose, Erythrulose, Ribulose.**

Oligosaccharides

- Oligosaccharides are compound sugars that yield 2 to 10 molecules of the same or different monosaccharides on hydrolysis.
- The monosaccharide units are joined by glycosidic linkage.
- Based on the number of monosaccharide units, it is further classified as disaccharide, trisaccharide, tetrasaccharide etc.
- Oligosaccharides yielding 2 molecules of monosaccharides on hydrolysis is known as a disaccharide, and the ones yielding 3 or 4 monosaccharides are known as trisaccharides and tetrasaccharides respectively and so on.
- The general formula of disaccharides is $C_n(H_2O)_{n-1}$ and that of trisaccharides is $C_n(H_2O)_{n-2}$ and so on.
- Examples: **Disaccharides include sucrose, lactose, maltose, etc.**

- Trisaccharides are Raffinose, Rabinose.

Polysaccharides

- They are also called as “glycans”.
- Polysaccharides contain more than 10 monosaccharide units and can be hundreds of sugar units in length.
- They yield more than 10 molecules of monosaccharides on hydrolysis.
- Polysaccharides differ from each other in the identity of their recurring monosaccharide units, in the length of their chains, in the types of bond linking units and in the degree of branching.
- They are primarily concerned with two important functions ie. Structural functions and the storage of energy.
- They re further classified depending on the type of molecules produced as a result of hydrolysis.
- They may be **homopolysaccharidese**, containing monosaccharides of the same type or **heteropolysaccharides** i.e., monosaccharides of different types.
- Examples of Homopolysaccharides are **starch, glycogen, cellulose, pectin.**
- Heteropolysaccharides are Hyaluronic acid, Chondroitin.