Lecture-4

Carbohydrates

1. Give three examples of monosaccharides?

Answer: Glucose (dextrose), fructose and galactose.

2. Differentiate between aldose and ketose sugar?

Answer: An aldose (glucose) has an aldehyde group; a ketose (fructose) has a ketone group. Example of aldose is glyceraldehyde, whereas for ketose, it is dihydroxyacetone. All aldoses have the CHO at the top and the CH$_2$OH at the bottom whereas all ketoses have the CH$_2$OH at the top and a carbonyl at the second carbon.

3. What is Pyran and furan rings?

Answer: Pyran is a six membered heterocyclic ring consisting of five carbon atoms and one oxygen atom and containing two double bonds; whereas Furan is a heterocyclic organic compound, consisting of a five-membered aromatic ring with four carbon atoms and one oxygen.

4. Distinguish between starch and cellulose?

Answer: Starch is a carbohydrate consisting of a large number of glucose units joined together by glycosidic bonds.

Cellulose is a polysaccharide consisting of a linear chain of several hundred to over ten thousand $\beta(1\rightarrow4)$ linked D-glucose units.
5. How lactose is different from maltose?

**Answer:** Lactose is a disaccharide consisting of one galactose and one glucose bonded through a β-1→4 glycosidic linkage, whereas maltose is a disaccharide consisting of two glucose units joined with an α (1→4) bond.