

Carbohydrates:

Carbohydrate are organic compound made up of carbon, Hydrogen and oxygen. The ratio of 1 carbon, 2 Hydrogen and 1 oxygen its chemical formula is  $(CH_2O)$ . Carbohydrate are use as a energy resource and storage. 50% of carbon on earth are present in carbohydrate form.

Classification of carbohydrate

Monosaccharide:

Monosaccharide are simplest form of carbohydrate they are made up of less carbon. Disaccharide and polysaccharide are made up of monosaccharide. They are divided on the bases of number of carbon.

For e.g

3 carbon sugar	→	Triose	<u>Chemical Formula</u>	→	$C_3H_6O_3$
5 carbon sugar	→	pentose	<u>C.F</u>	→	$C_5H_{10}O_5$
6 carbon sugar	→	hexose	<u>C.F</u>	→	$C_6H_{12}O_6$

(ii) Glucose:

Glucose and fructose have same chemical formula but differ in structure because in glucose present an aldehyde group. glucose is also known as blood sugar. They are present in e.g bread, pasta and fruit.

(iii) Fructose:

Fructose commonly found in fruits and honey. The ratio of fructose (1:1 glucose + fructose) and 30% sweeter than sucrose. It is metabolized in liver and provide energy. Fructose concentration increase it convert in to glucose. They are present in e.g soft drink and fruit drink.

Also draw the structure

Disaccharide:

When two monosaccharides are combine with glycosidic bond are called disaccharide and this process occur due to glycosidic bond called hydration process. They play an important role in diet. Disaccharide and monosaccharide are soluble in water.

(i) Lactose (glucose + galactose):  
Lactose are found in daily products like milk, Cheese, Yoghurt. Lactase is an enzyme convert lactose to monosaccharide if conversion not occur lactose intolerance.

(ii) Sucrose (glucose + fructose):  
Sucrose is also known as table sugar and sugar cane. sucrose break down into monosaccharide and it provide energy.

(iii) Maltose (glucose + glucose):  
Maltose is formed during the digestion of starch are present in malted milk shake. They are also found in plant & sprouting seeds.

Polysaccharide:

When multiply monosaccharide are combine through glycosidic bond are called polysaccharide.

(i) Starch:

Starch are present in plant. Starch are complex compound and its breakdown convert into glucose unit. glucose cell are used as energy source.  
e.g Amylose, Amylopectin.

(ii) Glycogen:

Glycogen is also known as animal starch and it store energy in the glycogen form. glycogen are highly present in liver and muscles.

(iii) Cellulose:

Cellulose are polysaccharide it provide rigidity to plant cell wall. They help to move food in small intestine.

## Proteins:

Protein word is derived from "Proteios" means Prime importance or first rank. It is composed of C, H, O and N elements. It is an abundant organic compound of cell and 50% dry weight of cell is composed by protein.

### Characteristics of proteins

- polymer of amino acids. (amino acids combine and make covalent bond are called peptide bond make chain like structure called protein)
- colorless and tasteless.
- Solubility depends on pH. (acidity is directly proportional to solubility)
- High molecular protein.
- 10,000 different protein.
- Main elements C, H, O, N
- also contain P, Fe, Cu, I, S, Zn

### Classification of proteins

Based on physical and chemical properties

#### Simple proteins:

one type of amino acids are called simple protein e.g. Albumin, globulin, collagen.

#### Compound protein or conjugated protein:

protein attach to non-protein group are called compound protein e.g. phospho protein and Lipo-protein.

#### Derived protein:

Derived protein from simple or conjugated protein and we process by heat, enzyme or chemical agents. e.g. proteases, peptones, oligo peptides.

## LIPIDS:

Lipids word derived from "Lipos" means fat. Lipids are made up of three components fatty acid, glycerol and sterols. Lipids are a diverse group of organic molecules that are hydrophobic and due to hydrophobic nature they are insoluble in water.

### Characteristics of lipids

- Heterogeneous group of substances.
- Insoluble in water.
- Soluble in organic substances like ether, alcohol.
- Poor conductor of heat and electricity.
- ~~Human~~ part of human diet.
- Used as raw material in manufacturing of soap, detergents, paints, polishes, cosmetics etc.

### Classification of lipids

#### Simple lipids:

Simple lipids are composed of fatty acid and glycerol e.g. fat and oil, triglycerides etc.

#### Compound lipids:

Compound lipids are made up of fatty acids, glycerol, phosphate e.g. phospholipids, glycolipids etc.

#### Derived lipids:

They are derived from simple and compound lipids all called derived lipids e.g. steroids, wax etc.

Mention the full qs statement for proper evaluation. Without that these are just notes and cannot be awarded marks