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Q:- Define carbohydrates, its types, characteristics and examples?

Ans:-

Introduction:-

Carbohydrates are the most abundant organic molecule in nature. They are primarily composed of the elements carbon,

Definition:-

Old definition of carbohydrates is hydrate of carbon (carbon, hydrogen, oxygen) formula $(C_nH_{2n}O_n)$.

Now carbohydrates may be defined as polyhydroxy ($-OH$), aldehydes ($-CHO$) or ketones ($C=O$)

Hydrates of carbon consist alcoholic group and Aldehyde or ketons. (one of them).

Characteristics:-

- 1) Carbohydrates are most abundant.
- 2) Their storage form is glycogen

- and stored in liver. again convert in glucose when our body needs energy
- 3) carbohydrates formed structure of cell membrane.
 - 4) Precursor for organic compounds (Lipids, Proteins).

Classification:-

carbohydrates are classified on the basis of number of sugar.

1) Monosaccharides:-

- It consist of one sugar molecule.
- It consist 3 to 7 carbon.
- It cannot broken down into simple substance of hydrolysis.
- These consist of single polyhydroxy aldehydes or ketones.

Example:-

- i) Glucose
- ii) Galactose
- iii) Fructose

2) Disaccharides:-

It consist of two sugar molecule.

Examples:-

Sucrose \Rightarrow contains in Sugar cane.

Lactose \rightarrow contains in Milk sugar

Maltose \rightarrow contains in malt sugar

Oligosaccharides:-

• It consist of two to ten sugar molecule.

• They can further broken down into monosaccharides.

Example:-

Raffinose

Polysaccharides:-

• It consist of ten or more sugar molecule

• These are more complex substances

It converts into two types

Homopolysaccharides:-

It consist single type of same monosaccharides

Examples:-

Starch:- It is storage food of plants.

Glycogen:- Reverse carbohydrate

oils

of animal deposits in liver and muscles as storage material.

Heteropolysaccharides:-

It is mixture of different monosaccharides.

Examples:-

- Heparin (work as anti coagulant)
- Hydrocolonic acid (Beauty Product)

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Q2:- Define proteins characteristics and classifications?

Proteins:-

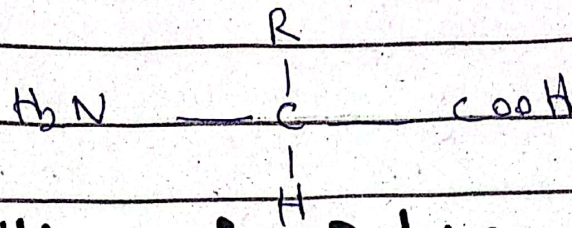
Introduction:-

Protein is derived from Greek word "Proton" means supreme / first. Proteins are most abundant organic molecules of the living system.

Definition:-

Amino acid are building block of proteins. They are connected to each other by a covalent bond. The proteins

are extremely complicated molecules and are nitrogenous compound.



Composition of Proteins:-

Carbon	50-50%
Hydrogen	6-7.5%
Oxygen	19-24%
Nitrogen	13-19% (essential component of Proteins)

Sulfur 0-4%

Structure of Proteins:-

- The structure of protein is complex.
- Long chain of amino acid linked by the peptide bond and polypeptides chain.

Characteristics of Proteins:-

- They are polymers of amino acids.
- Proteins are colorless and tasteless.
- The solubility of proteins depends upon the pH.

• They are high molecular weight biomolecules.

• There are 10,000 different kinds of proteins in human body.

Classification of Proteins:-

Based on Physical - chemical Properties:-

Simple Proteins:-

These proteins are made of only one type of amino acid as structural component. on decomposition with acids, they liberate constituent amino acids. They are most globular types of proteins.

Examples:-

Albumin, globulin, collagen etc
They are the most abundant proteins in animal kingdom

Compound or conjugated :-

The proteins, which is attached to some non-protein groups (prosthetic group). Examples are Phospho-protein, lipo-protein etc.

Derived Proteins:-

Those proteins which are derived from simple or conjugated proteins from the action of heat, enzyme or chemical agents. For example proteases enzymes, peptones, oligo peptides etc.

Based on the structure of Proteins:-

Primary Protein:-

Primary structure of protein is the linear sequence of amino acids that make up the polypeptide chain.

Secondary Protein:-

The linear, unfolded structure of polypeptide chain assumes helical shape to produce the secondary structure. The secondary structure refers to the regular folding pattern of twists and turns of the polypeptide chain.

Tertiary Protein:-

Tertiary Structure of Proteins is the three dimensional structure formed by the bending and twisting of the polypeptide chain. The linear sequence of polypeptide chain is folded into compact globular structure.

Q3:-

what are fats? its characteristics and types?

Fats:-

Defination:-

Fats are a subgroup of the macromolecules or polymers called lipids. Lipids are made up of the monomers fatty acids and glycerol. Lipids and their monomers are composed of the chemical elements carbon, hydrogen, and oxygen.

Characteristics:-

- They are most heterogeneous group of substances.
- They are insoluble in water soluble in organic compounds like ether, alcohol, chloroform, benzene etc.
- Fats, oils and steroids are most important lipids found in nature.
- They are poor conductor of heat and electricity.
- They not only occupy the place in human diet but also used as a raw material in manufacturing of soap, detergents, varnishes, paints, polishes, cosmetics and pharmaceuticals.

Classification:-

Simple Lipids:-

These are compounds of fatty acids with glycerol. For example; common fats and oils.

Compound Lipids:-

These are compounds of

fatty acids with glycerol and possess additional groups also. For example, phospholipids, glycolipids, lipoprotein.

Derived Lipids:-

These are the substances derived from simple and compound lipids by hydrolysis. Examples are sterols, vitamin D and Terpenes.