

Long Answer Questions

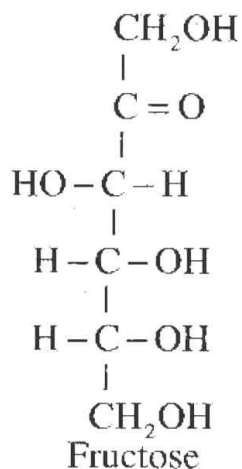
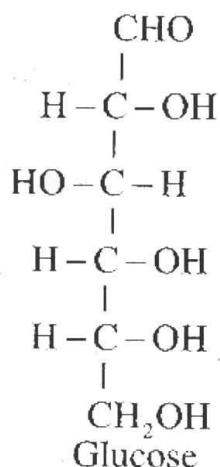
Q.1 What are monosaccharides? Describe with example

Ans. Introduction

Monosaccharides are the simplest sugars which cannot be hydrolyzed. They consist of 3 to 9 carbon atoms. Therefore, they are classified according to the number of carbon atoms in their molecules as trioses, tetroses, pentoses, hexoses, and so on.

Example

The important monosaccharides are hexoses like glucose and fructose, etc. Glucose is a pentahydroxy aldehyde while fructose is pentahydroxy ketone having the open chain structures as follows and general formula $C_6H_{12}O_6$



Properties

Monosaccharides are white crystalline solids. They are soluble in water and have sweet taste. They cannot be hydrolyzed. They are reducing in nature, therefore, these are called reducing sugars.

Q.2 Explain the Sources and uses of proteins.

Ans. Sources and uses of proteins

Proteins make up more than 50% of the dry weight of animals. Each protein has its source and carries out a specific function. Sources and uses of protein are as follows:

- (i) Sources of animal's proteins are meat, mutton, chicken, fish, and eggs. These are used as food by human beings as they are essential for the formation of protoplasm.

- (ii) Enzymes are proteins that are produced by the living cells. They catalyze the chemical reactions taking place in the bodies. They are highly specific and have extraordinary efficiency. Many enzymes are used as drugs. They control the bleeding and treatment of blood cancer.
- (iii) Hides are proteins. These are used to make leather by tanning. Leather is used to make shoes, jackets, sports items, etc.
- (iv) Proteins are found in bones. When bones are heated they give gelatin. Gelatin is used to make bakery items.
- (v) Plants also synthesize proteins, such as pulses, beans, etc. These are used as food.

Q.3 What are the natural sources and uses of lipids?

Ans. Natural sources and uses of lipids

Fats and oils are synthesized naturally by animals, plants and marine organisms.

- (i). Animal fats are found in adipose tissue cells. Animals secrete milk from which butter and ghee obtained. Butter and ghee are used for cooking and frying of food, for preparing bakery products and sweets.
- (ii) Animals fats are used in soap industry.
- (iii) Plants synthesize oils and store them in seeds, such as, sunflower oil, coconut oil, groundnut oil and corn oil. These oils are used as vegetable oils or ghee from cooking and other purposes.
- (iv) Marine animals like salmon and whales are also source of oils. These oils are used as medicines, e.g., cod liver oil.

Q.4 What are the beneficial aspects of carbohydrates to our body?

Ans. Beneficial aspects of carbohydrates

- i. Carbohydrate regulates the amount of sugar level in our body. Low sugar level in body results in hypoglycemia.
- ii. They provide essential nutrients for bacteria in intestinal tract that helps in digestion.
- iii. Dietary fibre helps to keep the bowel functioning properly.
- iv. Fibre helps in lowering of cholesterol level and regulates blood pressure.
- v. Carbohydrates protect our muscles from cramping.

Q.5 What is meant by dextrose? Write its composition and use.

Ans. Introduction to Dextrose

Dextrose is crystallized glucose (natural sugar found in starchy foods). It provides simple carbohydrates to the body that can be easily broken down and processed.

Composition

Dextrose solution is available in several concentrations. For example, five percent dextrose solution (D5W) consists of 5 grams of dextrose in each 100 ml. of solution.

Uses

It is used to provide fluid replacement and energy to the body. It contains approximately 170 calories of energy, but does not contain electrolytes. Therefore, electrolytes are added according to requirements in solution. Dextrose is given to patients directly into vein called intravenous (IV) therapy. It is commonly called drip system. It is the fastest way to deliver fluids, electrolytes and medications throughout the body. It prevents air entering into blood stream.

Q.6 Write a note on DNA.

Ans.

DNA consists of deoxyribose sugar.

Structure of DNA

Its structure was discovered by J. Watson and F. Crick in 1953. It is long double stranded molecule consisting of two chains. Each chain is made up of sugar, phosphate and a base. The sugar and phosphate groups make the backbone of the chains and two chains are linked through bases. The chains are wrapped around each other in a double helix form as shown in figure

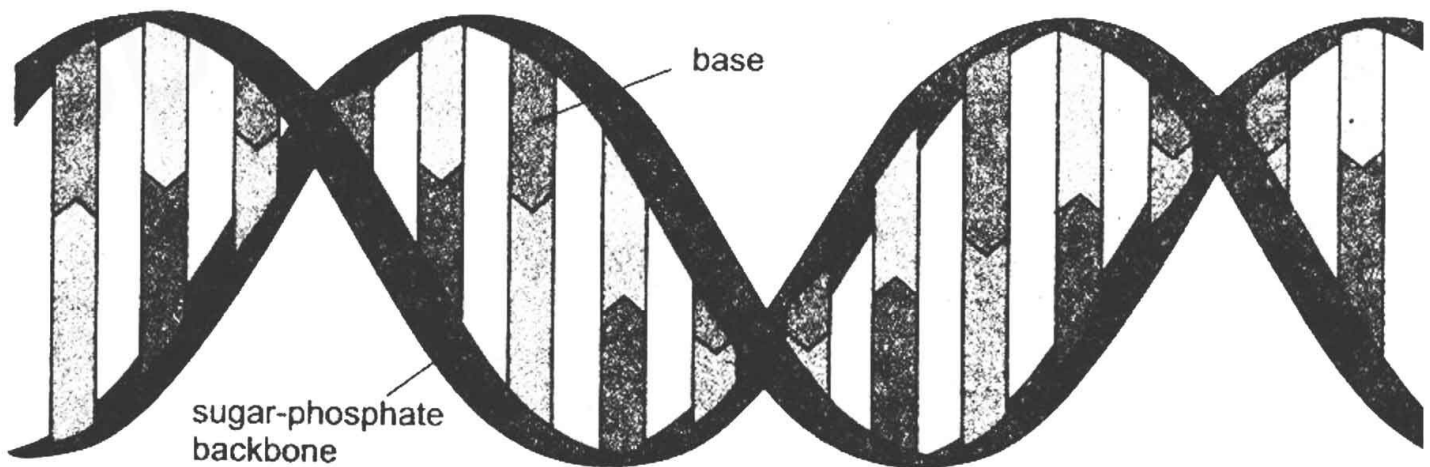


Fig. DNA Structure

Applications of DNA

DNA is the permanent storage place for genetic information in the nucleus of a cell. It carries and stores all genetic informations of the cell. It passes this informations as instruction from generation to generation how to synthesize particular proteins from amino acids. These instructions are a “genetic code of life”. They determine whether an organism is a man or a tree or a donkey and whether a cell is a nerve cell or muscle cell.

The sequence of nitrogenous bases in DNA determines the protein development in new cells. The function of the double helix formation of DNA is to ensure that no disorder takes place. DNA carries genes that control the synthesis of RNA. Errors introduced into the genes synthesize faulty RNA. It synthesizes faulty proteins that do not function the way they are supposed to. This disorder causes genetic diseases.

Q.7 What is the importance of vitamins in our daily life?

Ans. Importance of vitamins in our daily life

- (i) Each vitamin plays an important role in the healthy development of our body
- (ii) Natural vitamins are organic food substances found only in plants and animals. Our body is unable to synthesize vitamins. Because of this, they must be supplied either directly in the diet or by way of dietary supplements. They are absolutely necessary for our normal growth.
- (iii) Vitamins cannot be assimilated without ingesting food. This is why, it is suggested that vitamins must be taken with meal. They help to regulate our body's metabolism.

Q.8 Write uses of enzymes on commercial scale

Ans. Following are some of the uses of enzymes on commercial scale:

- i) Enzymes present in the yeast are commercially used for the fermentation of molasses and starch to produce alcohol (Ethanol). These enzymes are diastase, invertase and zymase.
- ii) Microbial enzymes are used in detergents (powder or liquid). Lipases decompose fats into more water soluble compounds. Amylase removes starch based stains. Cellulase degrades cellulose to glucose a water soluble compounds. Bacterial proteases break down protein stains on the clothes. Thus, enzymes containing detergents clean effectively and remove all stains on dirt.
- iii) Enzymes are use for the purification of fruit juices. They are added to fruit that has been crushed like grapes. This increase the yield of the juice extracted by removing suspended particles. It also improves the colour derived from the fruit skins.
- iv) Amylase enzymes are used in bread making because they can yield more starch of the flour. Even they are efficient enough to convert starch to sweet glucose syrup. This can be used as sweetener in the food as well as bread making.
- v) Lactase enzyme is used to increase sweetener in ice cream. As lactose in milk is broken down to galactose and glucose, which are sweeter than lactose.
- vi) In the dairy industry some enzymes are used for the production of cheeses, yogurt and other dairy products while others are used to improve texture or flavours of the products.