

Q: A) Describe different Causes and Prevention of Polio?

Introduction

Poliomyelitis (Polio) is a highly infected viral disease, which mainly affects young children. There are just 2 countries, which have never stopped transmission of polio. The 2 countries are Afghanistan and Pakistan. As long as a single child remains infected, children in all countries are at risk of contracting failure.

Causes of Polio

The poliovirus spreads in human faeces. People become infected with the virus through contaminated food and water, especially in areas where sanitation and hygiene are poor. Improper sewage disposal, for example, can contaminate a water supply. Poliovirus typically enters the body through the mouth and proceeds through the digestive tract to the intestine. After multiplying in the body, the virus is shed in the faeces, from which it can spread and cause further infection, especially when infected people do not wash their hands and touch food or other people. Adults can become infected by

changing the diapers of an infected infant and then touching their Mouth.

Prevention of Polio

There is no cure for Polio, it can only be prevented. Immunization with Polio Vaccine is the best way to prevent Polio. Vaccines work by exposing the body immune system to a microbial infection that is strong enough to provoke an immune response but not severe enough to result in full-blown illness. In response to the infection, the immune system produces antibodies to fight the infectious agent. Once the body has overcome the challenge of the vaccine-induced infection, the antibodies can recognize and quickly handle any subsequent invasion by the same agent.

Conclusion

Polio cases have decreased by over 99% since 1988, from an estimated 350,000 cases then, to 74 reported cases in 2015.

b) Define the term Biofuel. How is it helpful to promote Clean energy?

Introduction

Bioenergy is energy derived from biofuels. Biofuels are fuels produced directly or indirectly from organic materials. Overall, Bio energy covers approximately 10% of the total world energy demands. More advanced and efficient conversion technologies now allow the extraction of biofuel from materials such as Woods, Crops and waste material.

Biofuels can be solid, gaseous or liquid, even though the term is often used in the literature in a narrow sense to refer only to liquid biofuels for transport.

Biofuels may be derived from agriculture Crops including conventional food plants or from special energy Crops. Biofuels may also be derived from forestry, agricultural or fishery products or municipal waste, as well as from the agro-industry and food industry.

Biofuel is Helpful to Promote Clean Energy

The most widely used liquid Biofuels for transport are ethanol.

and biodiesel and the gaseous biofuel in biogas. They all are helpful to promote the clean energy.

Bioethanol

Bioethanol is a type of alcohol that can be produced using any feedstock containing significant amount of sugar, such as sugar cane or beet, starch, such as maize and wheat. Sugar can be directly fermented to alcohol, while starch 1st need to be converted to sugar. The fermentation process is similar to that used to make wine or beer, and pure ethanol is obtained by distillation. The main producer of Bioethanol are Brazil and USA.

Ethanol can be blended with petrol or burned in nearly pure form in slightly modified spark-ignition engines. A litre of ethanol contains approximately two third of energy provided by a litre of petrol. However, when mixed with petrol, it improves the combustion performance and lowers the emission of carbon monoxide and sulphur dioxide.

Biodiesel

Biodiesel is produced, mainly in the European union, by combining vegetable oil or animal fat with an alcohol. Biodiesel can be blended with traditional diesel fuel or burned in its pure form in compression ignition engines. Its energy content is somewhat less than that of diesel (88 to 95%). Biodiesel can be derived from large range of oils, including rapeseed, soybeans, Palm Coconut and therefore the resulting fuels can display a greater variety of physical properties than ethanol. Biodiesel is produced through the process of esterification.

Biogas

Biogas typically refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen. Biogas can be produced from raw material such as agriculture, waste, manure, municipal waste, plant materials, sewage, green waste or food waste. Biogas is a renewable energy source and in many cases produces a very small carbon dioxide and other gases.

Biogas can be produced by anaerobic digestion with anaerobic organisms which digest material inside a closed system or fermentation of biodegradable materials. Biogas is a clean and efficient fuel. It is a mixture of methane, carbon dioxide, hydrogen and hydrogen sulphide. The chief constituent of biogas is methane. It can be combusted or oxidized with oxygen. This energy release allows biogas to be used as a fuel. It can be used for any heating purpose, such as cooking. It can also be used in a gas engine to convert the energy into electricity and heat.

(C) Define Carbohydrates. Describe different steps to digest these in the human body

Introduction

Carbohydrates are the human body's key source of energy, providing 3.9 calories of energy per gram. When carbohydrates are broken down by the body, glucose is produced. Carbohydrates are organic compounds, these comprise of only carbon, hydrogen and oxygen. The hydrogen: oxygen ratio is usually 2:1. The empirical formula of carbohydrate is $(C_m(H_2O)_n)$. Carbohydrates are also known as saccharides, the word saccharide comes from Greek word sakkaron which means sugar.

Digestion of Carbohydrate in Human body

From the Mouth to the Stomach:

The mechanical and chemical digestion of carbohydrate begins in the mouth. Chewing crumbles the carbohydrate foods into smaller and smaller pieces. Saliva contains the enzyme, "salivary amylase" this enzyme breaks the bond between the

monomeric sugar units of disaccharides, oligosaccharide and starches.

The salivary amylase breaks down amylose and amylopectin into smaller chains of glucose, called dextrins and maltose. The increased concentration of maltose in the mouth that results from mechanical and chemical breakdown of starches in whole grains is what enhance their sweetness.

When the carbohydrates reach the stomach no further chemical breakdown occurs. because the amylase enzyme does not function in the acidic conditions of the stomach.

From the Stomach to the Small

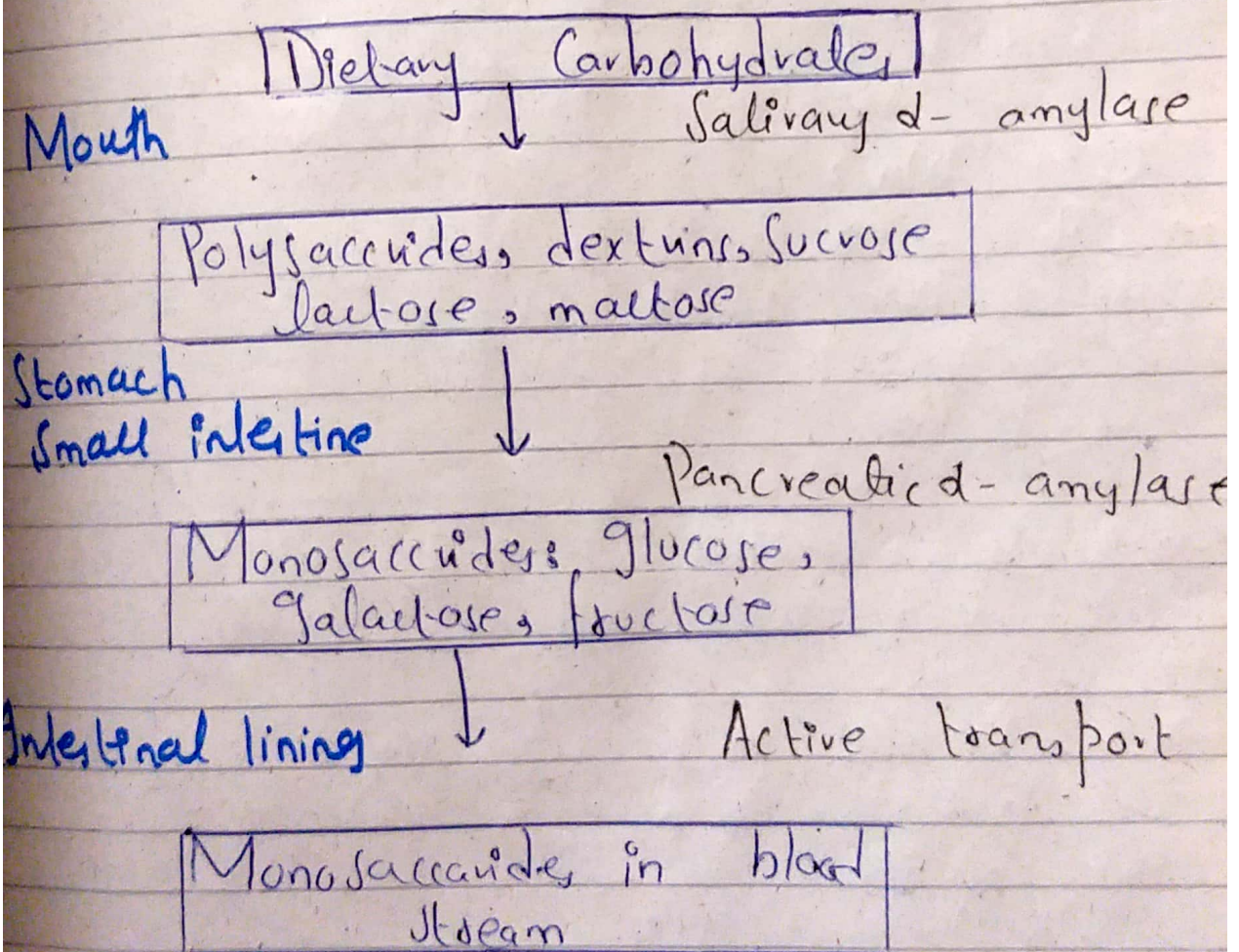
Intestine :

The chyme is gradually expelled into the upper part of small intestine upon entry of the chyme into the small intestine, the pancreas release pancreatic juice through a duct. This pancreatic juice contains the enzymes pancreatic amylase which starts again the breakdown of dextrins into shorter and shorter carbohydrate chains. Once carbohydrates are

Chemically broken down into single sugar units they are then transported into the inside of intestinal cells.

Colon

Anything that's left over after these digestion process goes to the Colon. It is then broken down by intestinal bacteria. Fiber is contained in many carbohydrates and cannot be digested by the body. It reaches the Colon and is then eliminated with your stools.



(d) Describe the Cell structure, write down at least three differences between an animal cell and Plant Cell

Introduction

Cell is the unit of structure and function of all living things. The cells that make up our body are so small that one cannot see a single cell with a naked eye. The word "cell" is derived from the Latin word "cellula" which means a little room. Organisms can be classified as unicellular and multicellular. The cell was discovered by Robert Hooke in 1665. Cytology is the study of all aspects of the cell.

Cell Structure

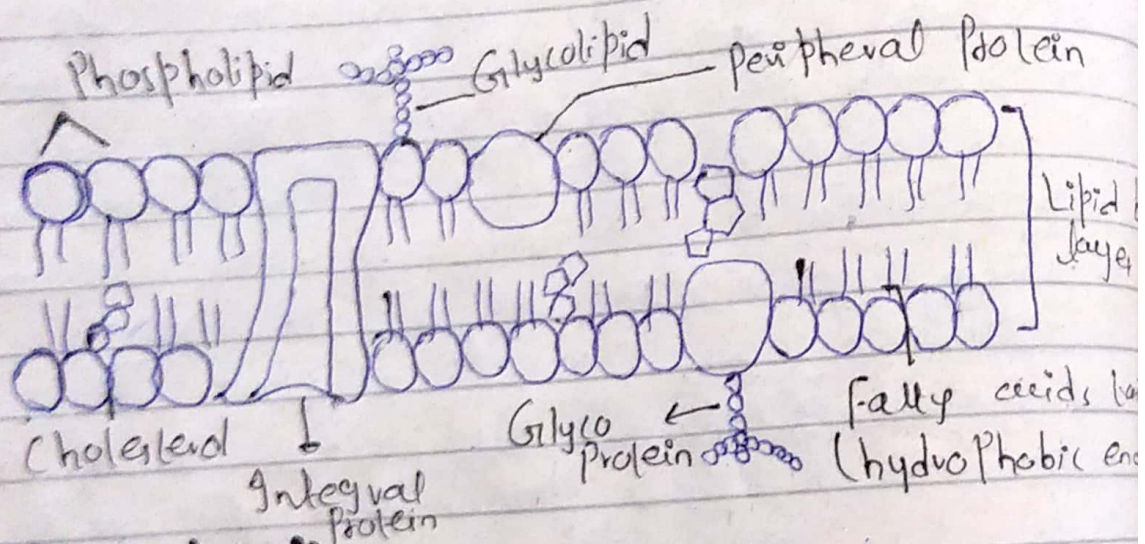
The cell structure comprises individual components with specific functions essential to ~~components~~ ^{with} carry out life's processes. These components are following

Cell Membrane

→ The cell membrane support and protects the cell. It controls movement of substances in and out of the cell. It separates the cell from the external environment. The cell membrane is

Present in all the cells.

→ The cell membrane is the outer covering of a cell with which all other organelles such as cytoplasm and nucleus are enclosed. It is also called plasma membrane.



Cell Wall

→ The cell wall is the most prominent part of the plant's cell structure. It is made up of cellulose, hemicellulose, and pectin.

→ It is a rigid and stiff structure surrounding the cell membrane.

→ It provides shape and support to the cell and protects them from mechanical shock and injuries.

Cytoplasm

→ The cytoplasm is a thick, clear jelly like substance present inside the cell membrane.

→ Most of the chemical reactions within a cell take place in this cytoplasm.

→ The cell organelles such as endoplasmic reticulum, vacuoles, mitochondria, ribosomes are suspended in this cytoplasm.

Nucleus

→ The nucleus contains the heredity material of the cell DNA.

→ It sends signals to the cells to grow, mature, divide and die.

→ The nucleus is surrounded by nuclear envelope that separates the DNA from the rest of the cell.

→ The nucleus protects the DNA and is an integral component of plant's cell structure.

Differences between Plant Cell and Animal cell

Animal cell

Plant cell

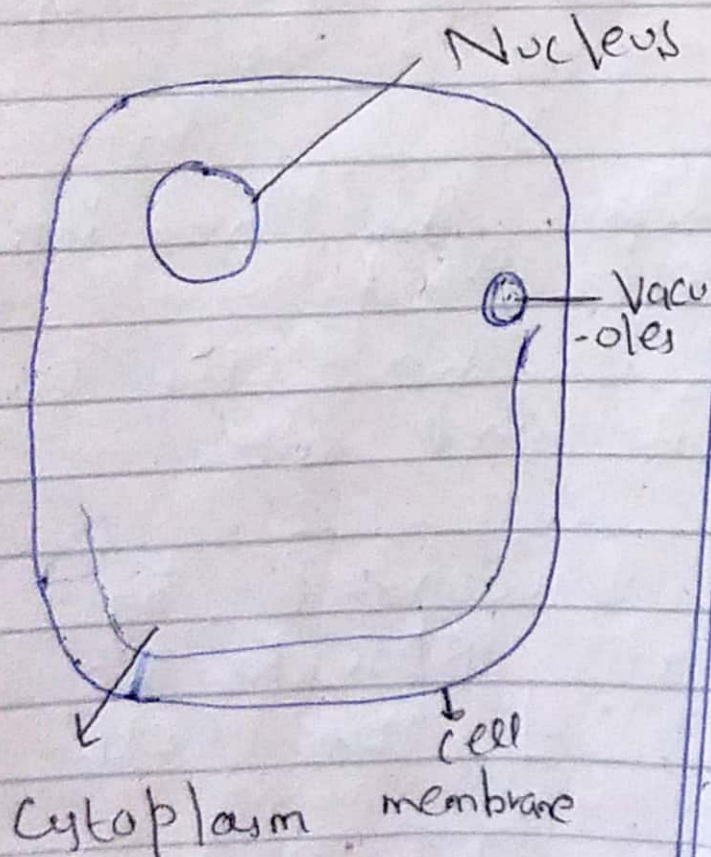
In Animal cell

|| cell wall present in

cell wall is absent

2) Vacuole small and temporary

3) Nucleus at the centre of the cell



in addition to plasma membrane and consist of middle lamellae Primary and Secondary walls

Vacuole large and permanent

Nucleus present along the periphery of the cell.

