CSS-18

Date

Q3

(A) Describe different causes and preventions of 'Polio'

Polio, or Poliomyelitis, is caused by the poliovirus, a highly infectious virus that primarily affects young children.

Causes

Fecal-oral Route	Oral-Oral Route	Direct Contact
The most common transmission method is when the virus is ingested via contaminated food or water	Less Common. Spread through Saliva from an infected Person.	close contact with an infected person.
⇓	⇓	⇓
due to poor Sanitation and hygiene.	Shared through Utensils or direct Contact.	can also spread through crowded living conditions.

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Prevention of Polio

Preventing polio relies heavily on immunization and maintaining good hygiene practices.

1: Vaccination

The most effective way to prevent polio is through vaccination.

1. There are two types of vaccination.

Inactivated Poliovirus Vaccine	2: Oral Poliovirus Vaccine
Administered via injection.	Administered Orally.
Used in many developed countries.	Commonly used in global polio eradication efforts due to its erase of administration and ability to induce immunity in the gut, which helps stop person to person transmission.
It contains an inactivated virus and is very effective in preventing poliovirus infection.	

2: Hygiene and Sanitation:

Improved sanitation reduces the risk of fecal-oral transmission.

This includes: Ensuring clean drinking water ~~proper clean drinking water~~, Encouraging hand washing with soap and clean water, especially after using the bathroom and before eating.

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3: Public Heath Measures: These include: Surveillance and rapid response to outbreaks, Public education campaigns about the importance of vaccination and hygiene practices, ensuring access to clean water and sanitation facilitates, particularly in areas with high transmission risks.

4: Global Polio Eradiction Initiatives:

Organizations like the World Heath Organization (WHO), UNICEF, and the Global Polio Eradication Initiative (GPEI) work worldwide to vaccinate children, monitor polio causes, and respond to out breaks.

(B) Define the term 'Bio-Fuel'. How is it helpful to promote clean energy?

Bio-Fuel can be defined as;

"Biofuel refers to any fuel that is derived from biomass- plant or algae material, or animal waste."

Unlike fossil fuels, which take millions of years to form, bio fuels, which take millions of years to form, bio fuels are produced from living organisms and can be replenished on a human time scale. common example: (ethanol typically made from corn or sugar-cane)

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How Bio-Fuels Promote clean Energy?	1: Reduced Green House Gas Emission 2: Renewable Resources: 3: Economic Benefit: 4: Reduced Reliance on Fossil Fuels: 5= Biodegradability. 6: Energy Security.

1: Reduced Green Houses Gases Emissions:

Biofuels generally emit fewer green house gases compared to fossil fuels. When burned, they release (CO_2), but this CO_2 is offset by CO_2 absorbed by the planets during growth, resulting in a smaller net increase in atmospheric CO_2.

2: Renewable Resource:

Unlike fossil fuels, which are finite, biofuels are made from renewable resources that can be replanted and harvest regularly. This helps in ensuring a more sustainable energy supply.

3: Economic Benefits:

The biofuels industry can create jobs in agriculture, manufacturing, and distribution. This can stimulate local economies, especially in rural areas.

4: Reduced Reliance on Fossil Fuels:

Biofuels can replace or supplement fossil fuels, reducing dependence on oil and natural gas, which are major contributor to air pollution and climate change.

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Add examples against these arguments

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5: **Biodegradability:** Biofuels are typically biodegradable and less toxic than fossil fuels, reducing the environmental impact in the event of spills or leaks.

6: **Energy Security:** Producing biofuels locally can enhance energy security by reducing dependence on imported oil and promoting energy independence.

(C) Define 'carbohydrates': Describe different steps to digest these in the human body.

Carbohydrates can be defined as:

"Carbohydrates are organic compounds made up of carbon, hydrogen, and oxygen, typically with a ~~hydrogen~~ hydrogen-to-oxygen atom ratio of 2:1."

They are a primary source of energy for the human body and can be found in foods such as bread, rice, pasta, fruit, and vegetables. carbohydrates can be classified into three main types.

1. Monosaccharides:

Simple sugars like glucose, fructose, and galactose.

2. Disaccharides: Formed by the combination of two monosaccharides, such as sucrose (table sugar), lactose (milk sugar), and maltose.

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Draw the structures as well

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3. **Polysaccharides:** complex carbohydrates like starch, glycogen, and cellulose, composed of long chains and monosaccharides units.

Steps of Carbohydrate Digestion:

1. **Mouth** → Mechanical breakdown of food into smaller pieces increases the surface area for enzyme to act. Salivary amylase begins breaking down starches into maltose and dextrins (short chains of glucose)

2. **Stomach** → The acidic environment of the stomach inactivates salivary amylase, temporarily halting carbohydrate digestion. The stomach churns the food, mixing it with gastric juices to form chyme, although no significant carbohydrates digested.

3. **Small Intestine** → The chyme enters into small intestine, where the pancreas secretes pancreatic amylase into the duodenum. This enzymes continues breaking down starches into maltose, maltotriose, and dextrins. In the final stage Maltose convert into 2 glucose molecules, sucrose convert into glucose and fructose, and Lactose convert into glucose.

4. **Absorption** → These monosaccharides are absorbed by the epithelial cells of the small intestine. These monosaccharides enter the bloodsteam and are transported to the liver via the hepatic portal vein. In the liver, fructose and glactose are converted into glucose.

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5: Utilization and Storage: Glucose is used by cells throughout the body for energy through glycolysis, the Krebs cycle and oxidative phosphorylation. Storage: Excess glucose is stored as glycogen in the liver and muscles for later use. Any surplus beyond the storage capacity can converted into fat and stored in adipose tissues.

(D) Describe the cell structure. Write down at least three differences between plant and animal cell.

Cell Structure: Cell are the basic structural and functional units of life. Cell consist various organelles. each with specific functions that contribute to the cell's overall operation.

1: Cell Membrane: A phospholipid bilayer with embedded proteins that controls the passage of substances in and out of the cell.

2: Cytoplasm: A jelly-like substance that fills the cell and holds the organelles in place.

3: Mitochondria: Known as the powerhouses of the cell, they generate ATP through cellular respiration.

4: Nucleus: Contains the cell's genetic material (DNA) and control cellular activities. It is surrounded by a nuclear envelope with pores for material exchange.

5: Ribosomes: Ribosomes are protein synthesis also called protein factory of body.

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6: Endoplasmic Recticulum (ER)

Rough (ER): Attached ribosomes, it synthesizes Proteins.

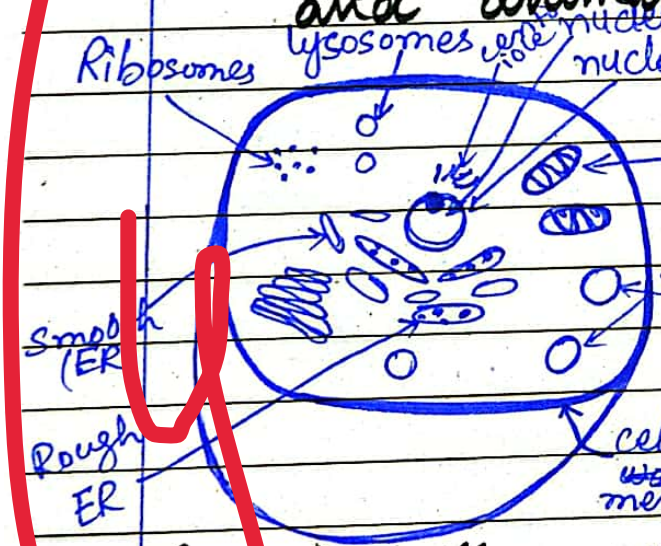
Smooth (ER): Lacks ribosomes and is involved in lipid synthesis and detoxification.

7: Golgi Apparatus: Packing proteins and lipids for storage or transport out of the cell.

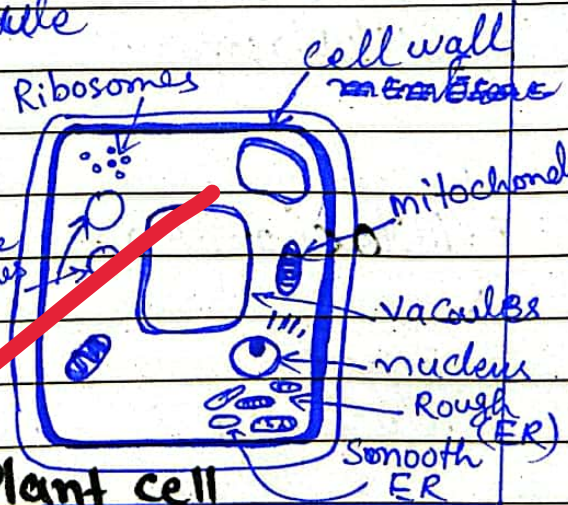
8: Lysosomes: contain digestive enzymes to break down waste materials and cellular debris (more prominent in animal cell).

9: Cytoskeleton: A network of protein filaments and tubles that provides structural support and facilitates cell movement and division.

Difference between plant and animal Cell:



Animal cell



Plant cell

Animal cell	Plant cell
1: Lack of cell wall	1: Lack of cell membrane
2: small, temporary vacuoles.	2: Large central Vacoule.
3: Donot Chloroplasts.	3: contain Chloroplasts for photosynthesis.

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