

18/40

GSA T 34

Q No 3

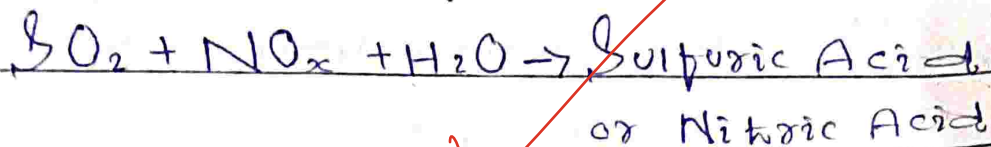
a) Working of Nephron in Human Body

The nephron functions via three main processes to filter blood and produce urine.

①

b) Acid Rain and Smog

Formation of Acid Rain



Formation of Smog

Smoke + Fog + Sunlight $\rightarrow$ Photochemical Smog

Acid Rain

$\rightarrow$ Effects of Acid Rain

- ① It corrodes buildings (stone leprosy)
- ② Acidifies lakes and killing fishes.
- ③ Leaches soil nutrients.

$\rightarrow$ Solutions of Acid Rain

- ① Scrubbers: Remove SO_2 from chimneys.
- ② Liming: Adding lime to acidic lakes to neutralize PH.

Smog

→ Effects of Smog

- ① It Reduces visibility and causes accidents.
- ② It causes respiratory failure (asthma).
- ③ It causes eye irritation.

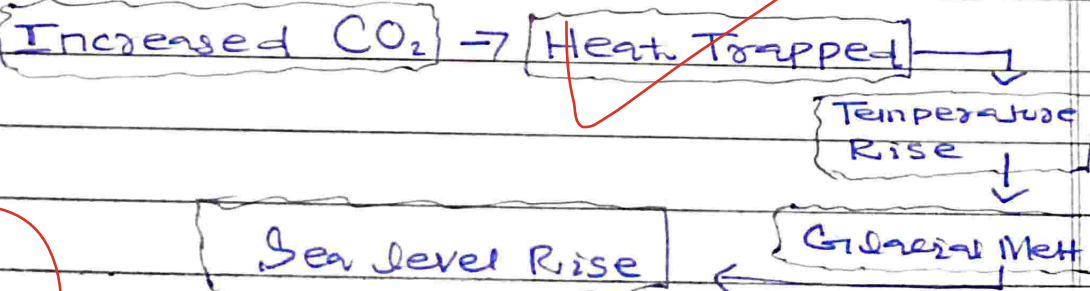
→ Solutions of Smog

- ① Use catalytic Converters in cars to reduce NO_x
- ② Use (Green Fuels) CNG or EVs instead of coal or diesel.

C. Global Warming as a Threat

The Greenhouse Effect trapping excess heat, raising earth's average temperature.

Threat Mechanism



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Global Warming: A Threat

1. Submersion due to Global Warming

Melting polar ice caps (Antarctica) raise sea levels, threatening coastal cities and islands (such as Maldives)

2. Agriculture Collapse: Consequence of Global warming

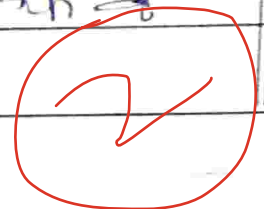
Irregular rainfall and heatwaves destroy crop yields causing food insecurity - a major threat.

3. Biodiversity Loss Due to Global Warming

Ocean acidification causes coral bleaching. Hence, species extinction rates increase.

4. Extreme Weather Conditions Due to Global Warming

The increased frequency of super-cyclones, floods, and wild fires.



D) Biofuels

Renewable fuels derived from biomass (plants or waste) rather than fossilization.

Production Flow Chart of Biofuels

1. Bioethanol

Crops (Corn or Sugarcane) $\xrightarrow{\text{Fermentation}}$ Bioethanol

2. Biodiesel

Vegetables (Oils or Fats) $\xrightarrow{\text{Transesterification}}$ Biodiesel

Benefits of Biofuels

1. Eco-Friendly

Biofuels are carbon neutral and biodegradable.

2. Energy Security

Biofuels reduce reliance on imported fossil fuels and price volatility.

3. Engine Cleanliness

Biofuels burn cleaner with fewer particulates and sulfur emissions compared to diesel.

4. Economic : One of Benefits of Biofuels

Supports the agricultural sector by utilizing crop waste and surplus.

Q NO 2

a) Water Pollution: Types and Measures

Water Pollution

It is the contamination of the water bodies (like, lakes, rivers and oceans) by harmful substances.

It makes the water unfit for use and toxic to the ecosystem.

→ Types of Water Pollution

1. Biological Pollution

It is caused by bacteria, viruses from sewage and animal waste, leading to diseases like cholera.

2. Chemical Pollution

It involves industrial effluents (heavy metals like lead, Mercury), pesticides, fertilizers and oil spills.

3. Physical Pollution

It includes thermal pollution (hot water from power plants) and plastic waste that damage aquatic life.

→ Control Measures For Water Pollution

1. Effluent Treatment Plants

Industries must treat waste before discharge.

2. Legislation: to control Water Pollution.

Impose strict enforcement of charges or fine for polluters.

3. Public Awareness to Overcome Water Pollution

Put Ban on single-use plastics and stopping direct dumping of trash in rivers.

b) Cell and Differentiation of Plants v.s Animal v.s Micro organism

Cell

A cell is the fundamental, structural and functional unit of all living organisms, containing genetic material and organelles to perform life processes.

Table

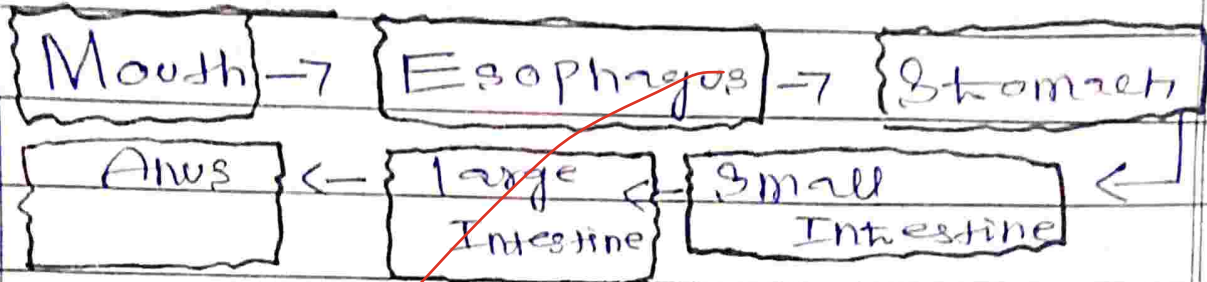
Feature	Plant Cell	Animal Cell	Microorganismic Cell
① Cell Type	True Nucleus	True Nucleus	No True Nucleus
② Cell Wall	Present cellulose	Absent	Present
③ Chloroplasts	Present photosynthesis	Absent	Mostly Absent
④ Vacuoles	large central vacuole	Small or Absent	Absent or Gas vesicles
⑤ Shape	Fixed, Rectangular	Irregular or Round	Varies (Rod, Sphere)

c) Digestion in Human Body

Digestion

It is the mechanical and chemical break down of complex food into absorbable nutrients.

Process of Digestion in Human Body



1. Ingestion (Mouth)

Teeth mechanically break down food and saliva starts carbohydrate digestion.

2. Propulsion (Esophagus)

Food moves down to stomach via peristalsis.

3. Digestion (Stomach)

Gastric juices like HCl kill bacteria and break down proteins into peptides.

4. Absorption (Small Intestine)

Bile emulsifies fats and villi absorb nutrients into the blood.

5. Egestion (Large Intestine)

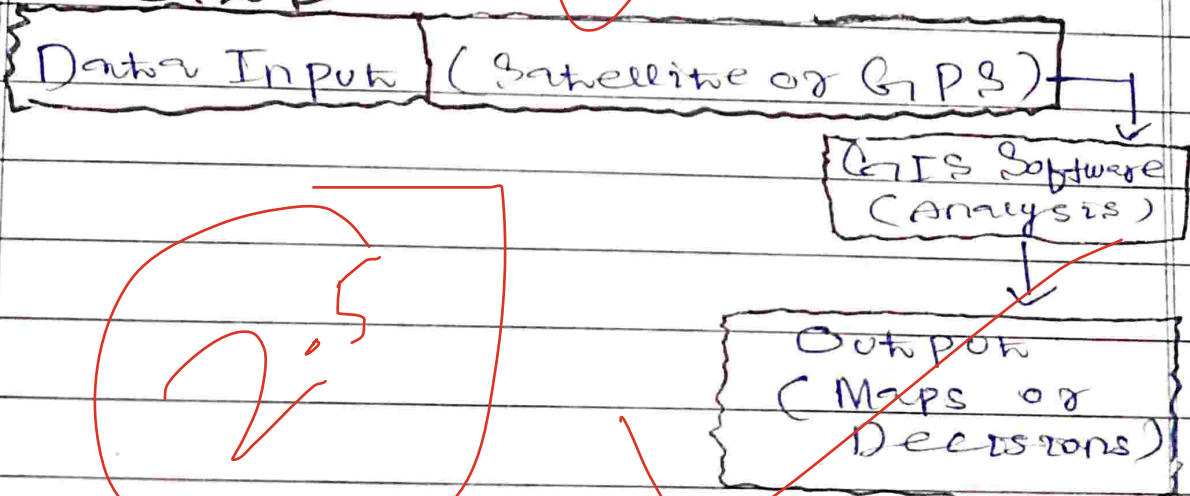
Water and salts are reabsorbed.
Undigested waste forms feces and is expelled via the anus.

d) GIS (Geographic Information System)

It is a computer based framework designed to capture, store, manipulate, analyze and display geographic data.

It layers information (maps, data) to visualize real-world problems.

Flowchart of Working of GIS



Environmental Applications of GIS

1. Disaster Management

It Helps in mapping flood-prone zones or tracking forest fire spreads.

2. Deforestation Monitoring

It is used in analyzing satellite imagery over time to calculate forest cover loss and plan reforestation.

3. Pollution Tracking

It is used in mapping the spread of oil spills in oceans and cities.

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