

27/10/20

Question No #01

Q. What is Circulatory system?
Describe the working of human heart.

Circulatory System:

The system which is involved in transport of nutrients and gases like O_2 , CO_2 is called Circulatory system.

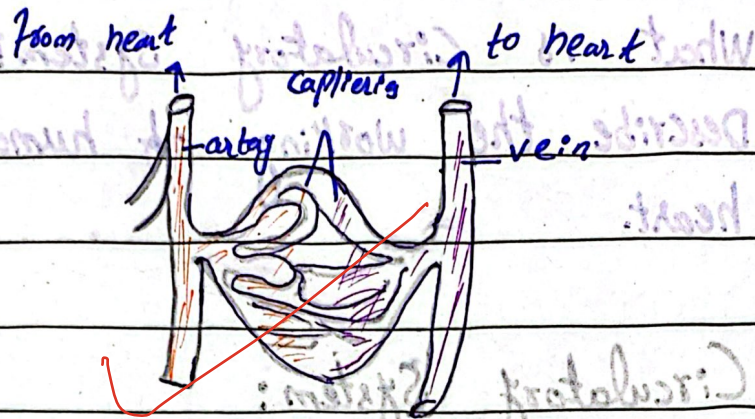
Components of Circulatory System:

It consists of three parts

1. Blood (Carries oxygen, nutrients & hormones)
2. Blood Vessels (Tubes that transport blood)
3. Heart (A pump that pushes through body)

Function of Circulatory System:

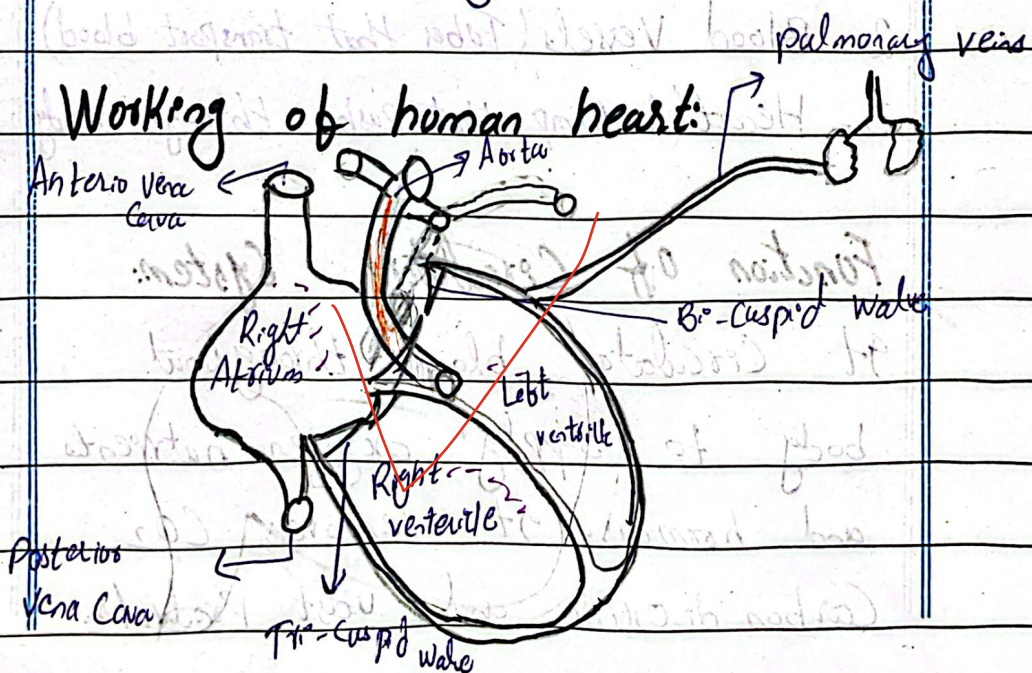
It circulates blood throughout body to supply oxygen, nutrients and hormones. It removes CO_2 , Carbon di-oxide and waste products.



Circulatory System Describe

2) Human Heart:

Human Heart is the pumping organ (enclosed in a double membrane) which pump blood into the body.



Anterior vena cava and posterior vena cava carries the de-oxygenated blood to right atrium. Right atrium contracts and blood move onwards to tri-cuspid valve that prevents the backflow of blood. The blood goes in right ventricle, again it contracts and blood moves to pulmonary artery which leads de-oxygenated blood to lungs. In lungs oxygen will add itself called oxygenation of blood. Then, pulmonary vein carries oxygenated blood to left atrium where Bicuspid valve opens and blood goes to left ventricle. Left ventricle contracts and blood enters in Aorta. Then Aorta

Supplies the blood first
to head and Neck then
arms and shoulder and at
last in lower body.

Right side of heart deals
with deoxygenated blood.

Left side of heart deals
with oxygenated blood.

De-oxygenated blood

Right Atrium

Right ventricle

Lungs

Left atrium

Left ventricle

Aorta

Body

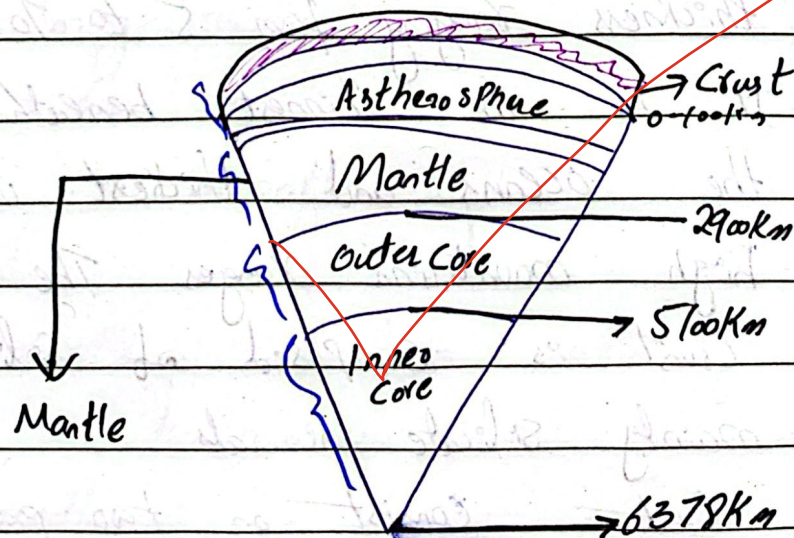
3.5

b- Explain the internal structure of Earth.

Earth:

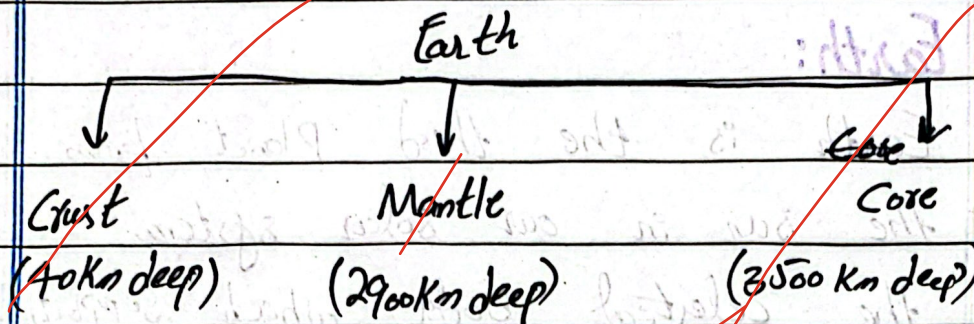
Earth is the third Planet from the sun in our solar system, the celestial body which supports life. It is the soft, loose material of the land surface consists on 71 percent oceans.

Internal Structure of Earth:



Internal Structure of
Earth diagram

Earth consists on mainly three layers;



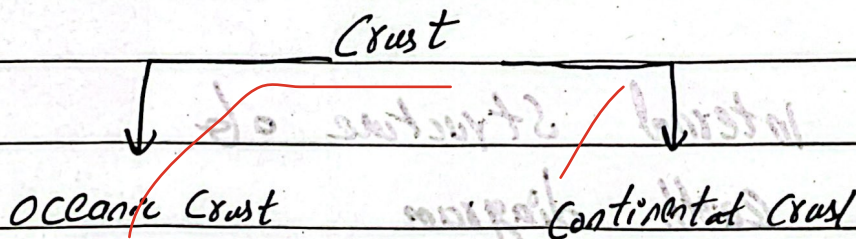
Crust:

The Crust is the outermost and thinnest layer of the earth with a thickness varying from 5 to 70 Km.

It is the thinnest beneath the oceans and thickest under high mountains ranges. The

Crust is composed of solids, mainly silicate minerals

Crust consist on two parts



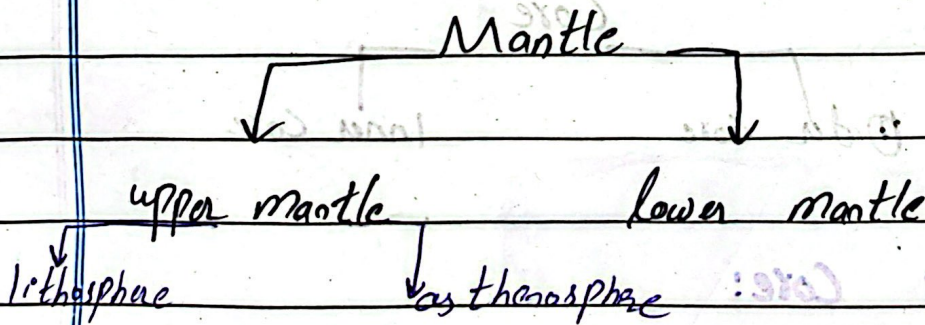
Oceanic Crust: It is continuously formed and 5-10km thick.

Continental Crust: It is about 30-70 km thick and more complex.

Mantle:

Beneath the Crust lies the mantle, extending to a depth of about 2900 km. It is the thickest layer of the Earth and is composed of silicate rocks rich in iron and magnesium.

It has two parts



upper mantle:

it is divided in lithosphere and asthenosphere.

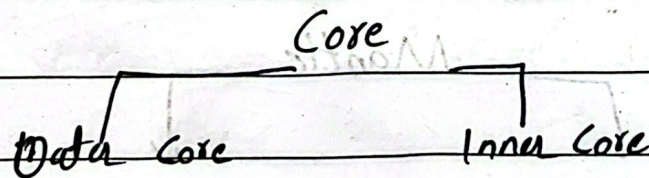
Lithosphere is rigid part made by tectonic plates.

Asthenosphere is semi fluid layer that drive plate tectonics

Lower Mantle: It is more rigid due to extreme pressure but still capable of slow flow.

Core:

The core is the innermost layer of the earth, with a radius of about 3470 Km. It is mainly composed of iron and nickel and consist on two parts.



Outer Core:

It is the liquid and extends from 2900 to 5150 Km and generates the earth magnetic field.

Inner Core:

It is the solid core due to extremely high pressure & high temperature.

The knowledge of internal structure of earth came from Seismology specifically the S and P-waves and Geomagnetism.

Question #03

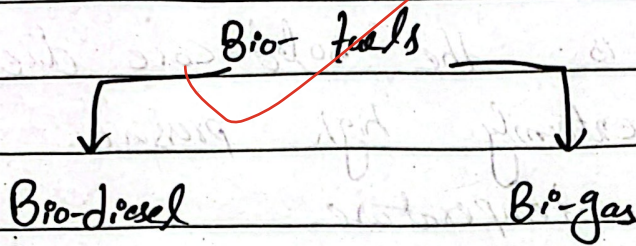
Explain the production of Bio-diesel & Bio-gas.

Bio-diesel & Bio-gas are the types of bio-fuels.

Bio-fuels:

Bio-fuels are alternative fuels and are environmental friendly. They are derived from bio mass, means biological material.

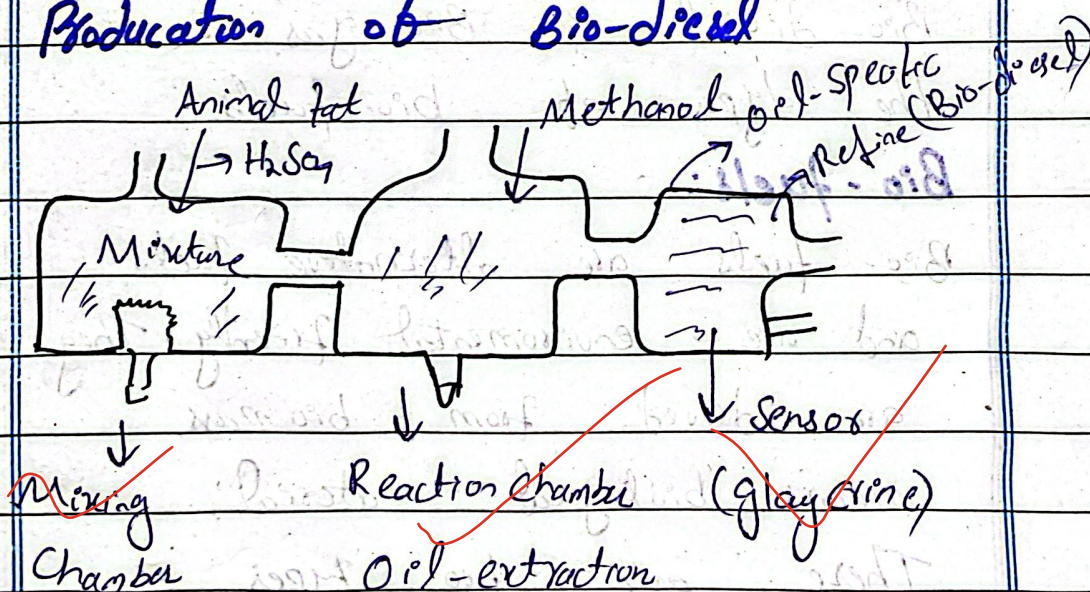
There are two types of bio-fuels.



Bio-Diesel.

It is an alternative of standard diesel and produced from vegetables oils, animal fats, or waste cooking oil. For its production, we have to rely on multiple chambered equipment.

Production of Bio-diesel



Process.

First of all, the oil is filtered to remove impurities. It is then reacted with a large amount of methanol. The resulting mixture is then washed.

Advantages

It is a renewable source of energy. It is biodegradable and does not pollute the environment. It is also a good alternative to fossil fuels.

Process.

First of all raw materials are filtered and heated to remove impurities. Then methanol is mixed with a catalyst. This mixture reacts with the oil breaking large fat molecules into smaller ones. The reaction produces the bio-diesel and glycerol as a by-product. Bio-diesel separated, washed and dried before use.

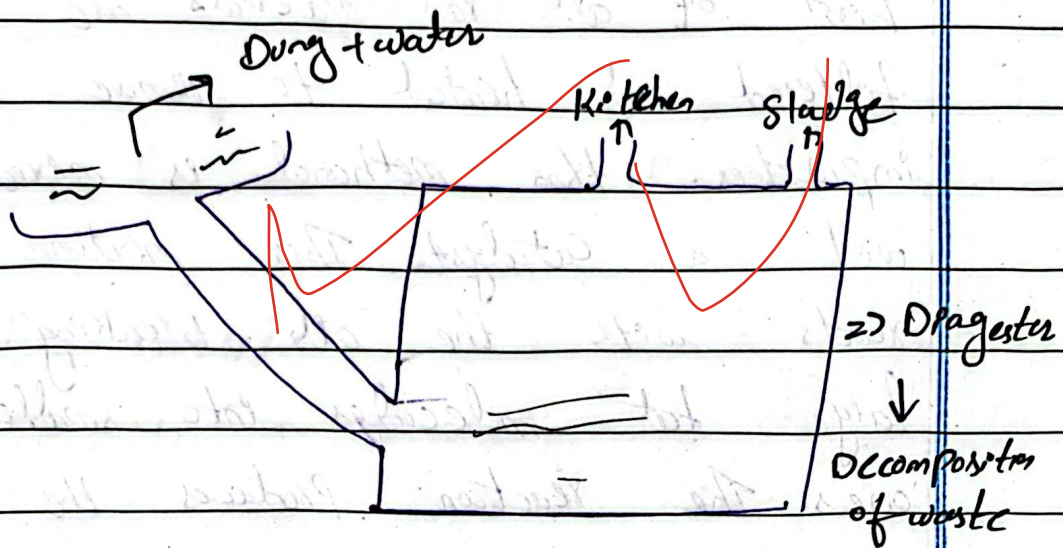
Advantages

It is used in vehicle engines and generators. It can run industrial equipment and reduce the air pollution.

Bio-Gas:-

Bio-gas is a mixture of methane (70%) and carbon-dioxide (30%). It is produced by decomposition of organic waste.

Process of Bio-gas



Process:

Bio-gas is produced by the organic waste mixed with water and slurry. The slurry is fed into an airtight digester. In the absence of oxygen, microorganisms break down the waste. This process produces bio-gas, mainly methane (CH_4) and carbon dioxide. The gas is collected for use, while the leftover slurry is called organic fertilizer.

Use:

It is used as cooking fuel and electricity generation.

Question #04

Explain the phenomenon of Earthquake.

Earthquake:

The sudden release of energy in the form of seismic waves that create vibration in the earth's crust is called earthquake.

Causes of Earthquake:

#1 **Tectonic movements:** The most common cause is the movement of lithosphere plates.

#2 **Volcanic activity:**

The movement of magma beneath the earth is one of the cause of earthquakes.

#03 Collapse earthquakes: The collapse of underground caves or mines leads to earthquake.

#04 Human activities.

Nuclear tests are one of the cause of earthquake.

Process of Earthquake

Earth moves in continuous slow motion. The tectonic plates in this rub, sink or separate from each other. At some point, those plates get stuck with each other. As they are moving continuously, so a strain appears on rock or plate. When strain rock cannot with. As the motion continues, strain builds up to the point where rock can't with stand further bend.

With an abrupt move rock break and the shaking of earth happen which is called Earthquake.

Cracks along which rocks slip are called faults.

The location on a fault where slip first occurs is called the focus, whereas the position directly above it on the ground surface is called epicenter.

Measurement of earthquake

A seismograph detects the vibration caused by earthquake.

Example of earthquake

7.6-magnitude earthquake took place on 8th October at 08:25 local time. The epicenter was Muzaffarabad.

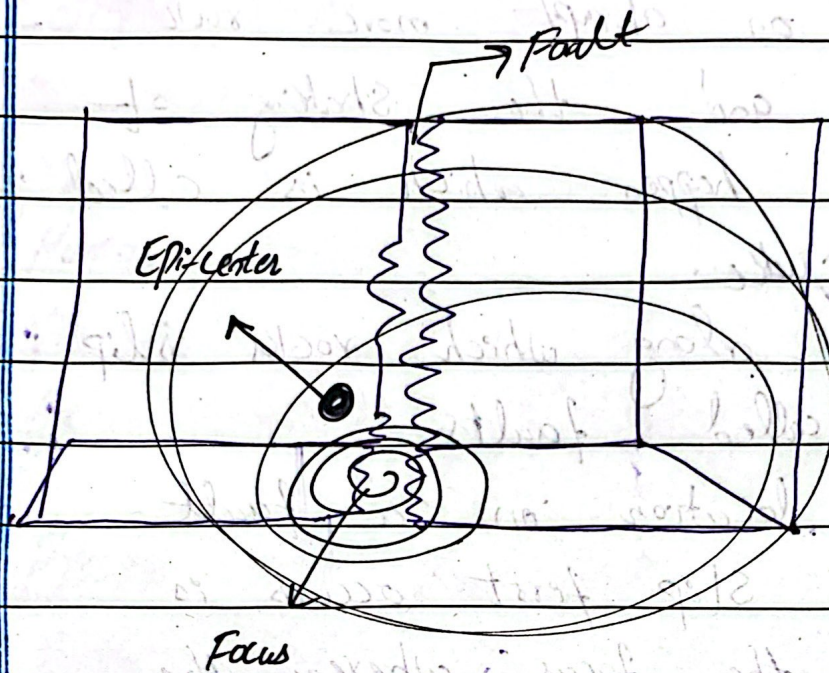


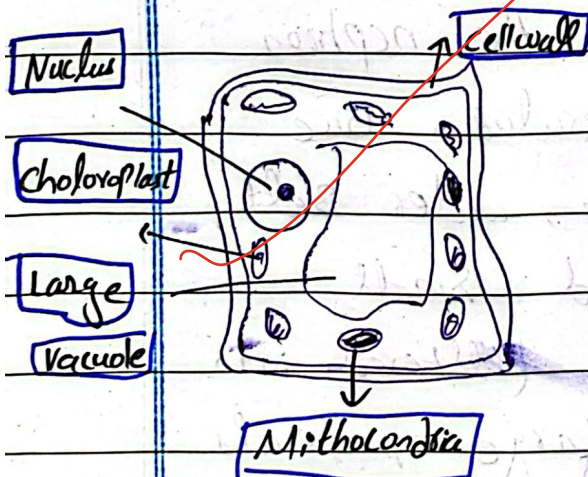
Diagram of Earthquake

Question No #02

Differentiate in between plant and animal cell.

Plant cell

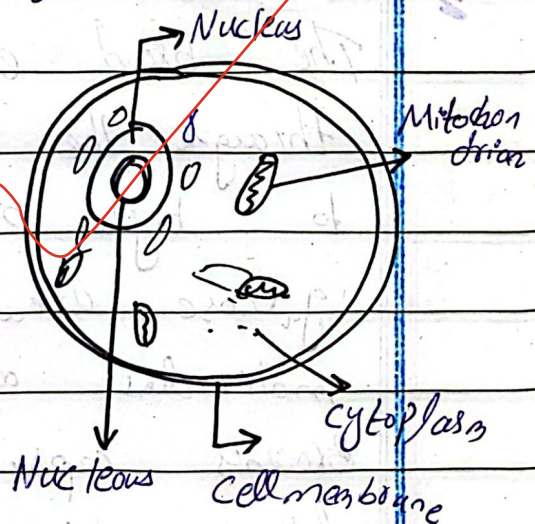
- i Plant cell has a cell wall.
- ii It has plastids.
- iii It has large vacuole present in the center of the cell.
- iv It has no centriole.
- v Nucleus is not present in the center of cell.



Plant cell
Diagram

Animal cell

- Animal cell has no cell wall. It has no plastids. It has small vacuoles, which are distributed throughout the cell. It has centriole near the nucleus. Nucleus is present in the center of cell.



Animal cell
Diagram

b- How Urine formation takes place in human.

Urine Formation

It is the process by which the kidney's remove waste products, excess water, and salts from the blood to maintain the body internal. The process takes place in nephrons.

Steps of Urine Formation

1 Glomerular Formation

The blood enters the nephron through the glomerulus. Due to high pressure, water, salt, glucose, urea, and small molecules are filtered into Bowman's capsule. Large molecules like proteins and blood cells remain in blood. The filtered

fluid is called glomerular filtrate

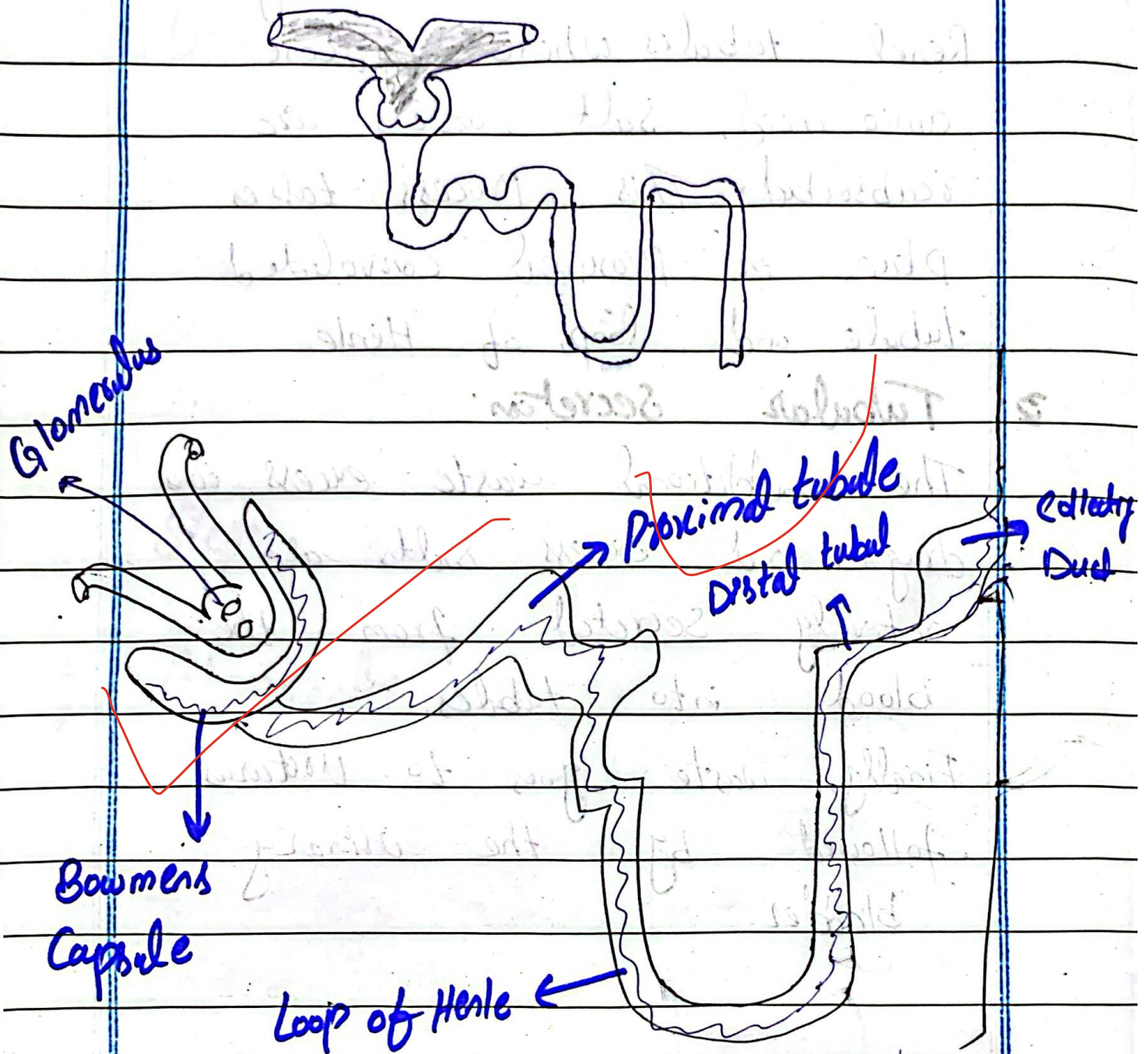
2. Tubular Reabsorption

That filtrate moves through renal tubules where glucose, amino acid, salt, waters are reabsorbed. This process takes place in proximal convoluted tubule and loop of Henle.

3. Tubular Secretion

The additional waste excess ions, drugs and excess salts are actively secreted from the blood into tubules.

Finally, waste goes to Ureters followed by the urinary bladder.



• Excretory system diagram

C What is DRM? Highlight the weaknesses in DRM of Pakistan.

Disaster Risk Management:

It refers to the systematic process of using policies, strategies and practices to reduce disaster risks, manage emergencies and minimize loss of life, property and livelihoods.

In Pakistan, it is mainly handled by institutions like the National Disaster Management Authority (NDMA), Provincial Disaster Management Authorities etc.

Weaknesses in Disaster Risk Management of Pakistan.

1. Lack of trained human resource

The lack of trained human resource, technical expertise and coordination is a weakness in management.

ii

Poor Coordination among Institutions:

There is a weak co-ordination between federal, provincial and district governments.

iii

Lack of Preventive Approach

Pakistan's DRM focuses more on relief and response than on risk reduction and preparedness.

iv

Lack of Awareness

The public is often unaware of disaster preparedness measures.

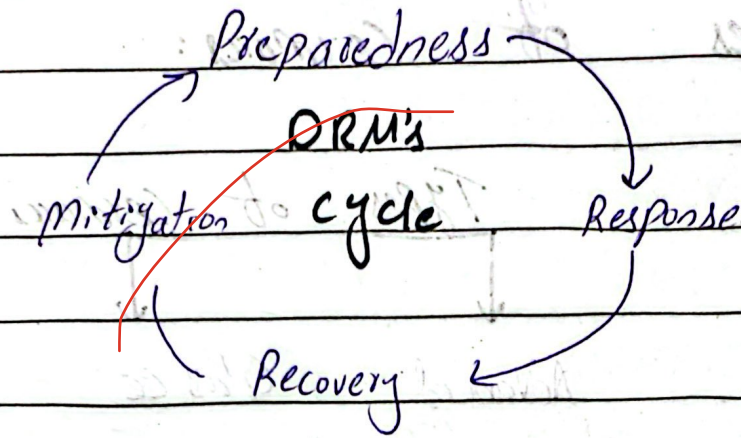
v

Inadequate Data Systems

Early warning systems are insufficient or poorly disseminated, especially in rural areas.

The weak use of risk mapping, climate data and technology makes DRM's weaker.

The Disaster Risk Management Cycle



d: Define Ceramics and give their types and applications.

Definition

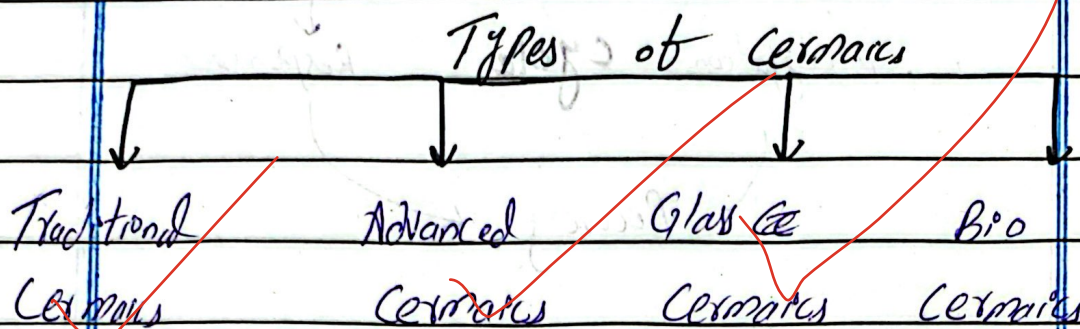
A ceramic is an inorganic non-metallic solid made up of clay that have been shaped and then hardened by heating to high temperatures.

Properties of Ceramics

- They are thermal insulators.
- They are oxidation-resistant.

- Ceramics are non-magnetic
- Ceramics are corrosion resistant

Types of Ceramics:



1. Traditional Ceramics:

They are white ware structural clay products. Bricks, tiles, pottery are examples of traditional ceramics.

2. Advanced Ceramics

They are manufactured from high purity synthetic compounds. They have high strength, wear resistance and thermal stability.

3. Glass Ceramics

They are produced by controlled crystallization of glass. Like telescope mirrors etc.

4. Bio Ceramics

They are used in medical applications. They are bio-compatible and non-toxic.

Applications of Ceramics

Aerospace: They are used in the formation of parts of space shuttle etc.

Medical: They are used in medical fields especially dental and bone filling.

Coatings: Ceramics are more corrosion resistant than most metals, manufacturers often coat metal with ceramic material.

Ceramics are versatile materials due to their durability, heat resistance and chemical stability.