

Date: _____

General Science - 01

May: _____

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Question no. 01

a) Circulatory System and Working of Human Heart:

• Circulatory System:

It is the system through which blood which is oxidized by lungs and contain dissolved nutrients is pumped by heart to the rest of the body through arteries and deoxygenated blood is transported back to heart through veins for oxygenation.

• Components of Circulatory System:

- i) Blood [plasma, blood cells, proteins]
- ii) Blood vessels [arteries, veins, capillaries]
- iii) Heart

• Working of Human Heart:

Following points explain its workings:

- i) Deoxygenated blood is carried by superior and inferior vena cava to right atrium of heart.
- ii) From right atrium, blood travels down to left atrium which transports it to

lungs through pulmonary arteries for oxygenation.

- iii) After oxygenation, blood enters left atrium of heart through pulmonary veins.
- iv) From left atrium, it goes down to left ventricle which transports it to aorta.
- v) Aorta transports ^{oxygenated} blood to whole body.

Hence, this is the way heart's functions. Its functioning can be given two names on the basis of working:

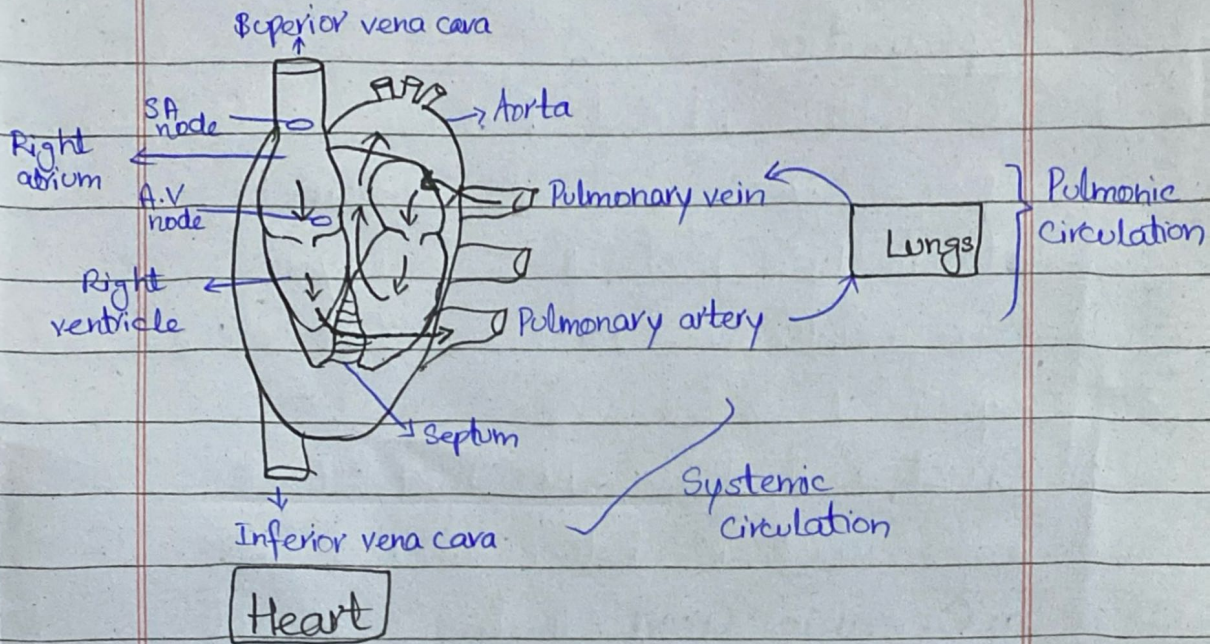
- i) The circulation of blood from heart to rest of the body except lungs is called systemic circulation.
- ii) The transportation of blood from heart to lungs and back to heart is called pulmonary circulation.

Diagram :

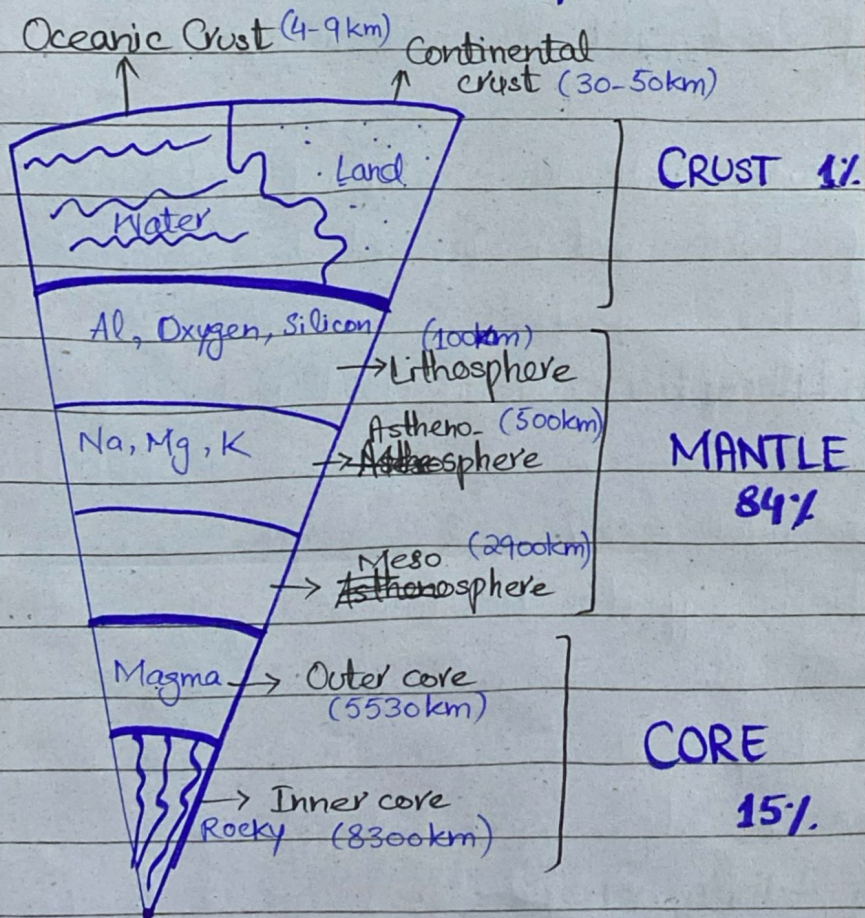
Following diagram explains functioning of heart :

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b) Internal Structure of Earth:



Explanation :

The Earth's internal structure consists of 3 layers which are subdivided into multiple parts. These 3 layers (core, mantle, crust) and their parts are explained below:

i) Crust : It forms 1% of total Earth's mass which is further divided into:

a) Oceanic Crust : It forms 5-9km of crust portion. It largely contains water.

b) Continental Crust : It forms 30-50km of crust and is covered by land.

ii) Mantle : It forms 84% of total mass of Earth and is present below crust. It has 3 parts:

a) Lithosphere : It is first portion of mantle covering a depth of 100km. It is rigid, rocky and compact layer which supports terrestrial ecosystems. It also allows hazards like earthquake to happen. It also plays major role in soil formation and nutrient cycles.

b) Asthenosphere : It is about 500km deep consisting of aluminium, potassium

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and sodium. However, it is loose and semi-liquid layer.

c) Mesosphere : It is 2900 km deep serving as last part of mantle.

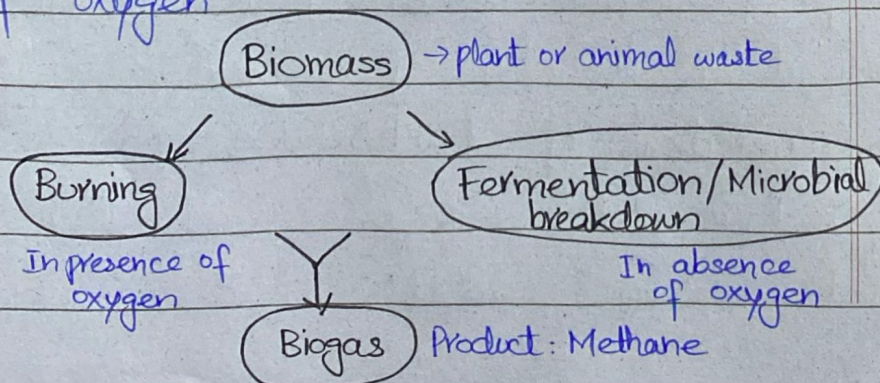
iii) Core : It forms 15% of the Earth's mass consisting of :

a) Outer core : It is 5530 km deep hottest layer of Earth containing magma.

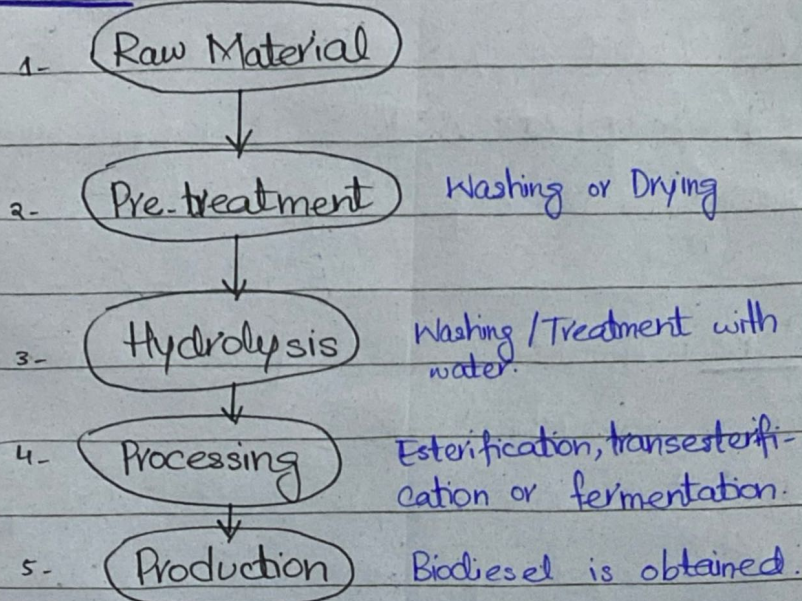
b) Inner core : It is the deepest layer with a depth of almost 8300 km and is mostly rocky.

c) Production of Biodiesel and Biogas :

- Biogas : Biogas is the gas which is obtained from the biomass i.e. plants, animals or their waste by either directly heating it or by microbial breakdown of biomass in the absence of oxygen



◦ Biodiesel :



For production of biodiesel, raw material is first pre-treated by drying, washing etc. It is then washed in the presence of water, a process called hydrolysis; then it is processed through fermentation, esterification or transesterification. The product is achieved in the form of biodiesel.

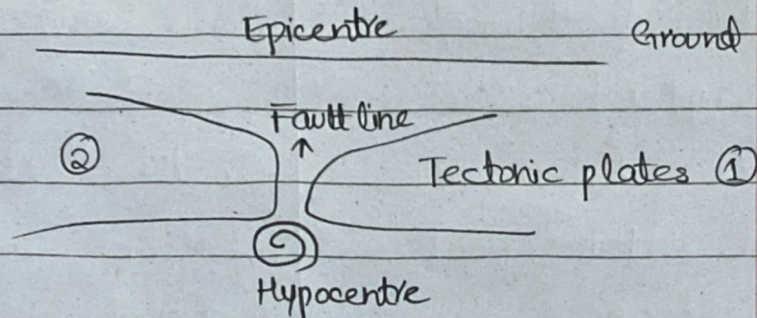
d) Phenomena of Earthquake :

Earthquake is the slipping past of the Earth's tectonic plates, releasing heat in the form of seismic waves.

Generation of Earthquake :

- Tectonic plates slip past each other at the point called "Fault line".

- The place where it begins is called 'Hypocentre' while the location above its hypocentre is called 'Epicentre'.



It is caused by seismic waves and its intensity can be measured on 'Richter Scale'.

Question no. 02

a) Plant Cell	Animal Cell
It contains two layers i.e. cell membrane and cell wall (primary and secondary cell wall in some plants).	It contains cell membrane as its outer-most layer.
Exchange of material occurs through cell wall which is rigid, made up of cellulose and lignin.	Exchange of material occurs through cell membrane which is semi-permeable in nature.

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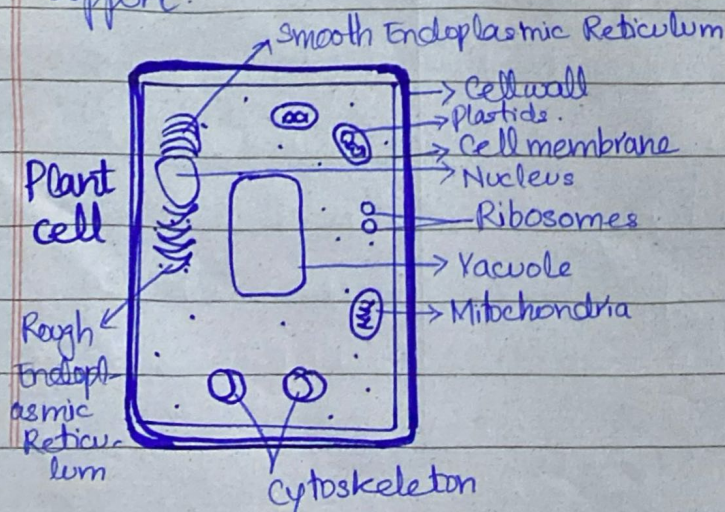
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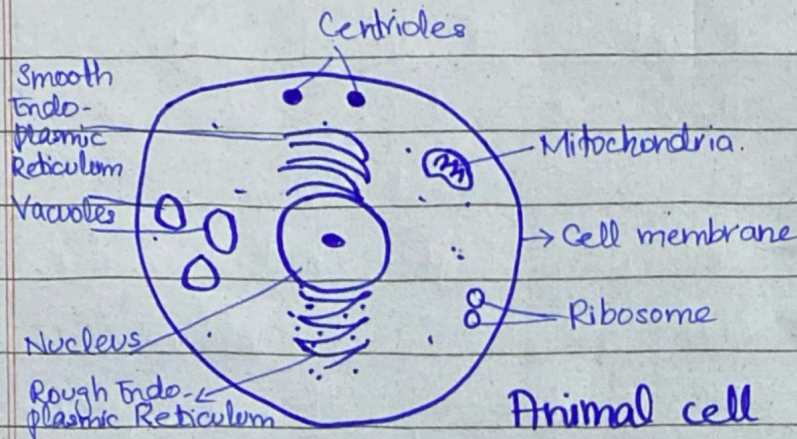
Plant cell

- It contains a big central vacuole which stores food and a peripheral nucleus.
- It contains plastids (chloroplast, chromoplast, leucoplast).
- It contains autotrophic mode i.e. prepares its own food.
- It does not contain centrioles.
- It contains true cytoskeleton which gives structural support.

Animal cell

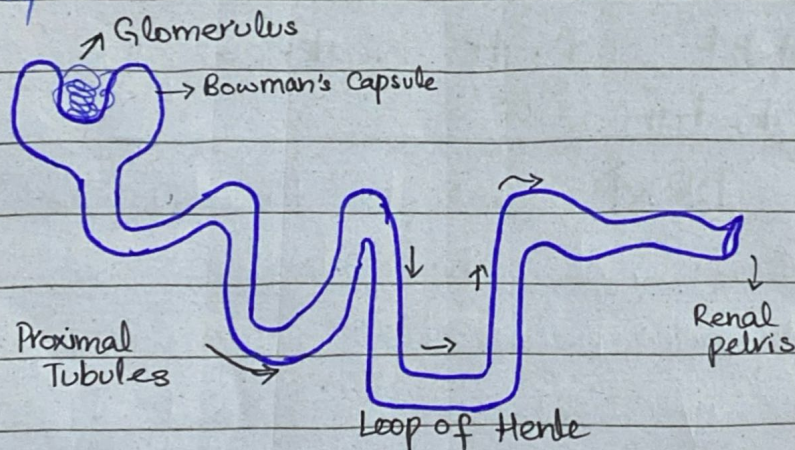
- It contains a big central nucleus and many small vacuoles which store waste.
- Plastids are absent in it.
- It has heterotrophic mode i.e. gets food prepared.
- It contains centrioles for meiosis.
- No true cytoskeleton is present.





b) Urine Formation:

Urine forms in nephrons - functional units of kidneys - in the following way:



▲ Structure of Nephron:

a) Pressure filtration: The dissolved salts, glucose etc. are filtered from glomerulus to Bowman's capsule, called Glomerular filtrate.

b) Selective reabsorption: From this filtrate, some salts and water are re-

bsorbed into blood through cappillaries while the rest containing urea, uric acid etc. are passed.

- c) Urine formation: After further water, salts and glucose reabsorption, urea, uric acid, creatinine, salts and rest of the water is transported to renal pelvis. This filtrate is called 'urea' which is passed out of the body through urinary bladder.

c) DRM and its weakness in Pakistan:

DRM stands for Disaster Risk Management which focuses on mitigation, preparedness, response and recovery mechanism to prevent high-risk disasters in the following ways:

- a) Preparedness: The system ensures early warning system, disaster awareness i.e. its symptoms and preventive measures and training to handle situation carefully.
- b) Mitigation: The system ensures structural and non-structural measures to mitigate disaster.

- c) Response: The system trains how to respond during disaster to prevent losses.
- d) Recovery: The system ensures rehabilitation and future protective measures.

Weakness of system in Pakistan:

- Absence of structural and non-structural measures: Pakistan lacks in proper planning measures and techniques i.e. building codes, disaster preparedness, response system and avoidance of infrastructure building on reclaimed lands.
- Lack of early warning system from minutes to seconds of warning about disasters make the country more prone to damages by hazards.
- Lack of proper training: In Pakistan, educational institutions and communities don't ensure proper training and drills to teach people how to act during disasters. Similarly, disaster management staff also lacks proper training to give first aid and rescue others.
- Lack of resources: Resource constraints including budget constraints make it difficult to build resilience within country.

d) Ceramics and their Types:

Ceramics are inorganic metallic, semi-metallic or non-metallic substance made up of clay and hardened by heating. The word ceramics is derived from Greek word 'keramikes' which means "pottery, clay".

Types and Applications:

a) Traditional Ceramics:

Traditional ceramics are ceramics simply made up of clay for household usage.

Applications: These are used to make pottery, kitchenware and decoration material.

b) Advanced Ceramics:

Advanced ceramics are modern ceramics used in industrial production, automotive and mechanical materials.

Applications:

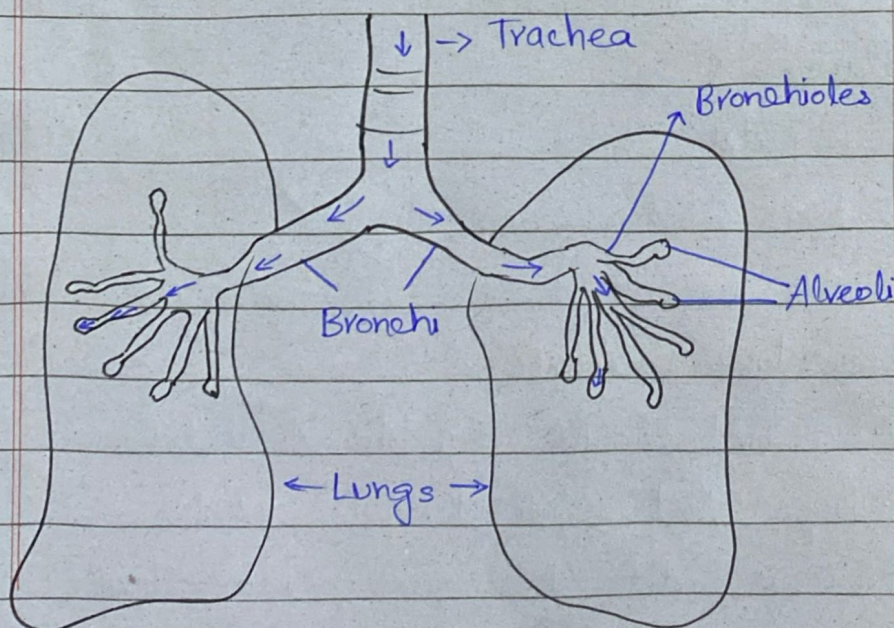
- These are used to coat metals, wires etc. as they are corrosion resistant.
- These are used in tiling, flooring etc.
- These are used to make parts of automotive machineries and digital devices.

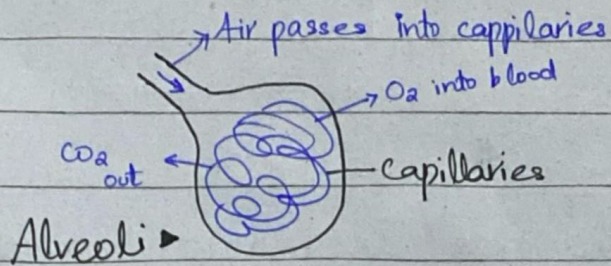
like camera, t.v etc.

Question no. 03

c) Gaseous Exchange in Humans:

In human bodies, gaseous exchange takes place through a process called "breathing". In it, oxygen is ~~inhaled~~ inhaled through nostrils and passed into bronchi through trachea. From bronchi, air enters bronchioles which pass it towards alveoli. Alveoli are air sacs in which there are capillaries. Through capillaries oxygen enters blood and carbon dioxide is passed out following reverse passage through exhalation.





a) Hepatitis :

It is defined as the inflammation of liver. It can be acute and can be turned into chronic illness called cirrhosis.

Symptoms :

- Yellow eyes as in jaundice.
- Bloating
- Loss of taste and appetite
- Fatigue
- Inflammation and chest burn.
- Diarrhoea

Causes :

- Hepatitis virus
- Toxic substances i.e. alcohol.
- Auto-immune diseases can also cause.

Preventive measures :

- Vaccination for Hepatitis A and C.
- Proper diet, bedrest, fruits intake.
- Clean water intake and avoiding toxins.