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General Science and Ability

Q #2

(a) Working of human heart

Structure of human heart

Human heart is muscular pumping organ made up of cardiac muscles. The outer layer is called pericardium and the inner layer is myocardium. Between the walls fluid is present which prevent the heart of shocks and jerks. Human heart is made up of four chambers the upper chambers are called atria (singular atrium). The lower chambers are called ventricles. Atria receive the blood in right and left atrium. Ventricles i.e right and left ventricles send blood out from the heart.

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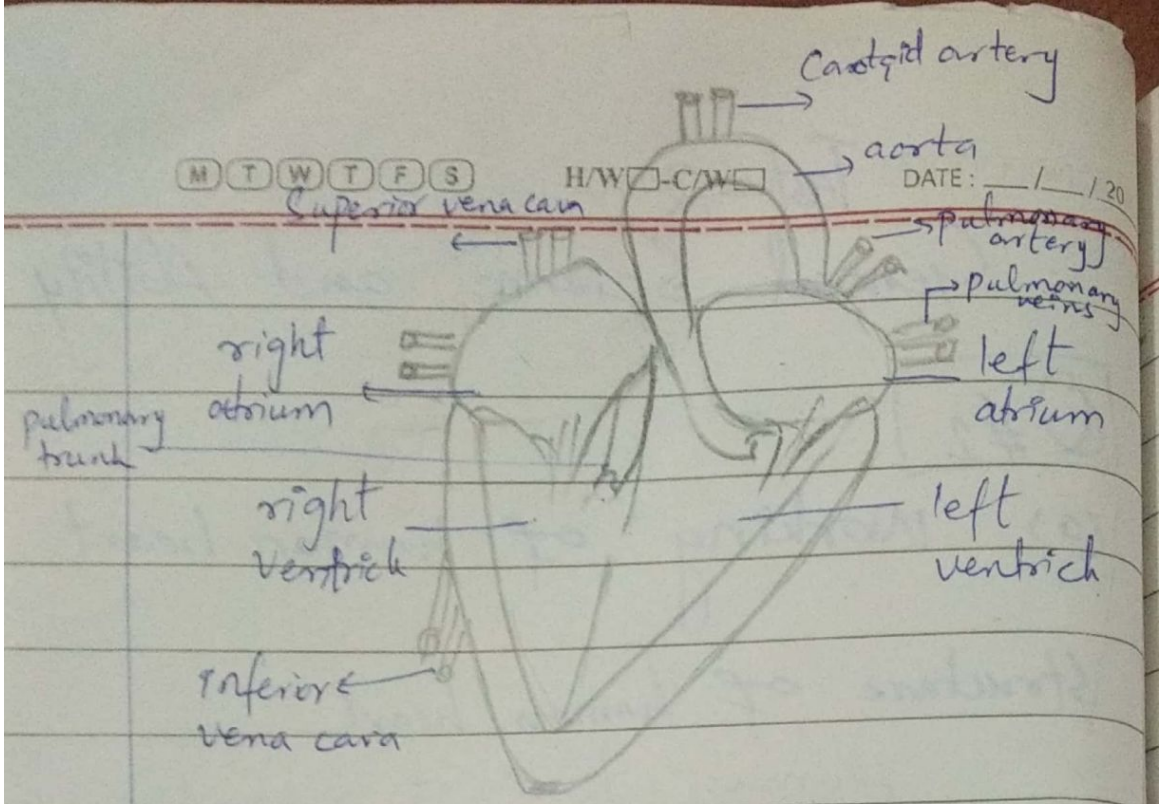

Function of human heart

Right side of the heart receives deoxygenated blood and left side of heart receives oxygenated blood. In right side blood is transferred from all over the body. In left side oxygenated blood comes from the lungs.

Right Side: In right side of the heart deoxygenated blood is carried from inferior and superior vena cava. Inferior Vena Cava carries blood from lower body

region and superior vena cava carries blood from head, arms and neck regions. Both of vena cavas takes the blood in right atrium. The arterioventricular value open and blood enters into right ventricle. From right ventricle blood enter into pulmonary trunk. Pulmonary trunk blood through pulmonary artries to the lungs.

Left Side: In both lungs the blood is purified i.e oxygen is added in blood and carbon dioxide is removed through inhalation and exhalation. The oxygenated blood carries through pulmonary veins towards left atria. From atria blood move toward left ventricle. From ventricle semi-lunar value of aorta opens and blood enter into aorta. Carotic artery on aorta carries blood to head region. Aorta

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descend on ventral side and distribute the blood in whole body.

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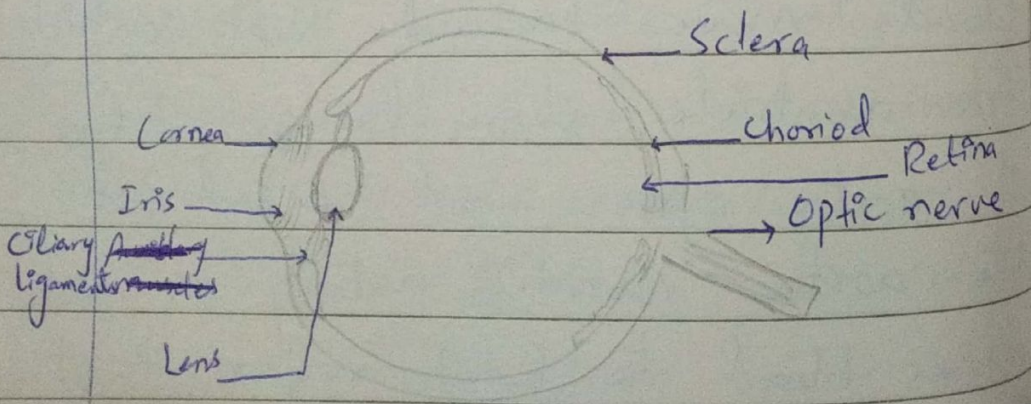
b. b- Vision in Humans

Vision in humans is carried through eyes. Eye has particular cells which assist in vision. Light is important for vision without light image cannot be formed on retina. In order to understand the working of human eye or its vision mechanism, the structure of eye is important to understand.



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Structure of eye

Human eyes are located in sockets of skull. The first layer is **sclera** which infront of eye is transparent and form **cornea**. Interior to sclera is **choriod**. It is thick & and have blood vessels it gives dark colour to internal region of eye. Thats why light is not refracted. On the interior side of cornea a small hole **pupil** is present which is surrounded by **Iris**. Iris is a colour part of eye which is either brown, blue, green or black. The **ciliary muscles** on both side of **lens** hang the lens in **viterous humour**. Between cornea and lens **aqueous humour** is present. Between lens and retina viterous humour is present. Parallel to the lens is **retina** which is a sensitive part of eye composed of rods and cons.

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Function of the Eye

Cornea: Light enter the eye through cornea. It is transparent and receive light.

Pupil: is a hole which adjust its size according to the intensity of light. In bright light pupil contrict (small diameter) and in dim light it dialate (large diameter)

Lens: After pupil, light hit the lens which has attached ciliary muscles. It adjust the size of lens i.e either the object is far or near. It adjust the size of image and the light transmit to retina.

Retina: Retina is the photosensitive area of the eye. Image is formed on the retina through rods and cons. Rods give the colour perception to the image and cones gives the sharpness

to the image.

Nerve impulse generation

The rods have pigment called rodopsin and cons have pigment called idopsin. When light falls on rod and cons it break and generate a nerve impulse. This nerve impulse passes to brain through optic nerve. The cerebrum having optic lobe interpret the information and the perception of image becomes possible.

Conclusion

Human eye is a receptor which receive information only in the presence of light. Eye receives the information and carries to the brain, where the nerve impulse is interpreted and image is formed.

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(C) Biofuels and its importance

Biofuels

Bio-fuels are fuels produced from the remains of plants. It is also produced from animals excretion such as dung, manure Biofuels are produced from the organic matter produced from plants and animals.

Sources of biofuels

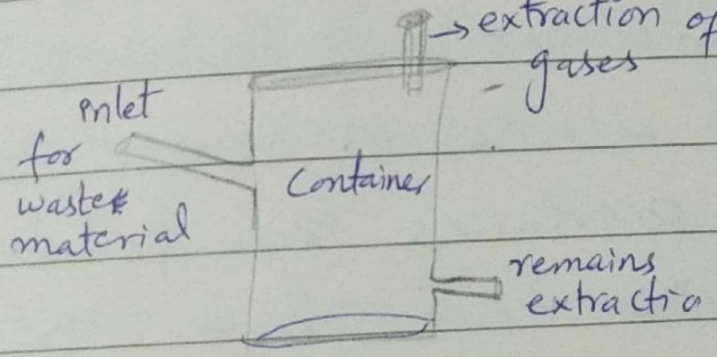
Sources of biofuels include animals waste and plants remains like unnessary parts of crops. These sources of animals and plants are fermented to produce biogas and biodesel.

How biofuels are formed?

Biogas as biofuels

Biogas is produced in a large container. The animal waste

is placed in a container and covered it. Through microorganisms action, the animal waste is converted into methane gas. Through pipes gas is extracted from the container and the remains of the waste in a container is used as fertilizer in farms.



Bio-gas Production

Bio-diesel as fuels

Bio-deisel is formed from the plants remains. Bio-ethanol is a cheap source of ~~electricity~~ energy production. It is produced from crops. The remains of the plants such as stems and other extra parts of crops are used for

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bio-deisel production.

Significance of biofuels

Biofuels are important in context of increasing demands of fossil fuels.

1. As the prices of hydrocarbons i.e oil and gas are increasing immensly. In this scenario biofuels can be used as cheap alternatives source.
2. It produces less pollution in the atmosphere as fossil fuels.
3. As the fossil fuel is a non-renewable energy source. The biofuels are the renewable source of energy.
4. The sources of biofuels are are cheap and easy to available.
5. It has a cheap sources for production of energy. It is mainly suitable for domestic purpose

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Conclusion

The immense demand of fossil fuels and its skyrocketing prices increases the demand of ~~fossil~~ biofuels. It is a cheap, renewable, alternative source of energy production.

(d) Differentiate plant, animal and microorganisms cell

Cell is the basic structural and functional unit of cell. All the activities of the cells, on the whole make the activities of an organism. At cellular level the function of the cells are same. But the structure of plant, animal and microorganism ~~are~~ is different from each other.

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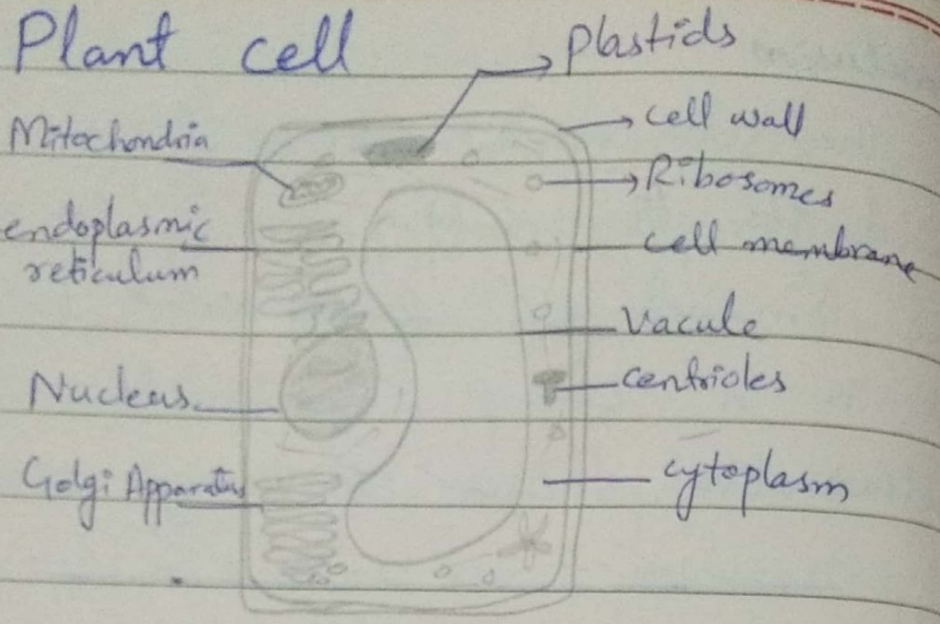
Plant cell



structure of plant cell

→ Plant cell has outer cell wall and inside cell wall plasma membrane is present. Inside the cell is a large vacule. The jelly like material or the fluid is called cytoplasm which has scattered ribosomes On one side of the vacule, nucleus is present. Attach to nucleus is the endoplasmic reticulum. One one side of the nucleus golgi apparatus is present. Mitochondria is present for the cellular respiration.

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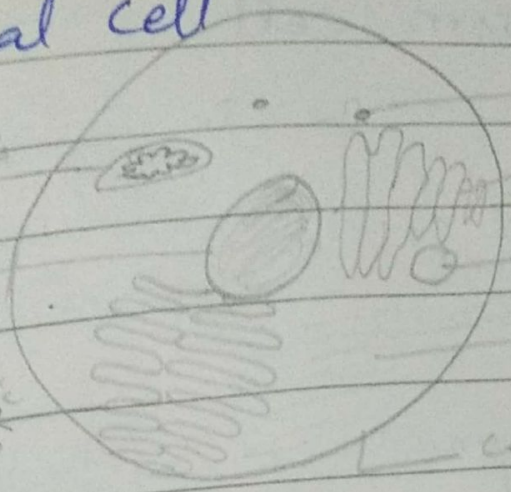
Animal cell



Structure of Animal cell

In animal cell the outer boundary is cell membrane. In the interior of the cell a nucleus is present. Attached to the plasma membrane is endoplasmic reticulum. One end of the endoplasmic reticulum is attached with nucleus and other end with plasma membrane. Golgi apparatus is present which helps in protein manufacturing. Mitochondria helps in the cellular respiration. In contrast to plant cell small vacules are present. Ribosomes are present which helps in protein synthesis.

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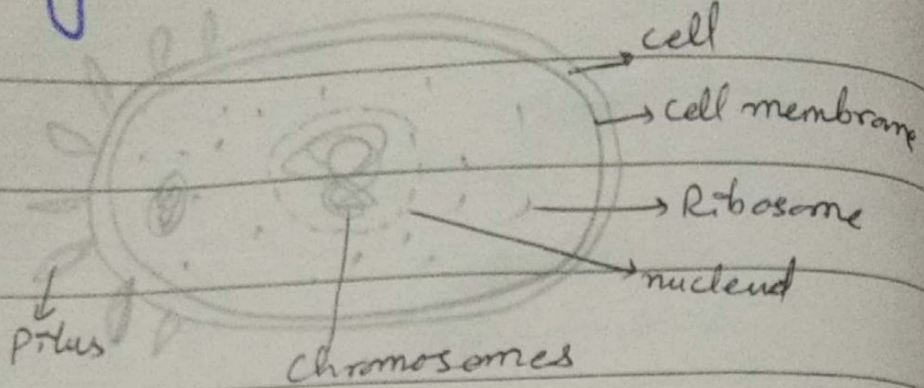
Microorganism cell



Microorganism cell is prokaryotic. It has no true nucleus. The chromosome is embeded in the nucleoid region of the cytoplasm. It has dispersed ribosomes in the cytoplasm. It has outer cell wall and cell memberane which protect the cell. The ribosomes are smaller in size. It has external regions or extensions called pilli. It is used during reproduction.

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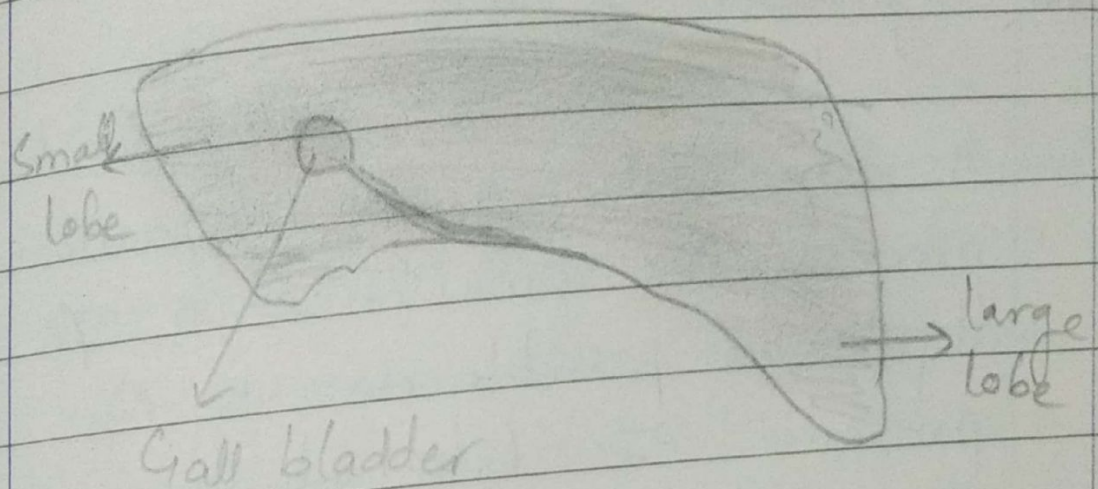
Q#2

(d) Liver in human body



Liver is the large organ in the human body. It is reddish brown in colour. It is responsible for the production of bile. The bile stored in gall bladder. The bile released from gall bladder when needed in a body. It is protected by the rib cage in the chest cavity.

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Liver as chief chemist

Liver perform the following functions in the body

1. ~~It synthes~~
1. Synthesis of bile

liver produce bile which is used during the digestion process. The emulsification of lipids is possible due to the presence of bile. It surround the ~~fat~~ lipid drops and convert it into small droplets which can easily absorb in the lacteal of the villus in small intestine.

2- De-toxification of food

The nutrients absorb in small intestine first transferred to the liver through hepatic portal vein. The toxins in absorbed food detoxify in the liver. Then blood is carried to the heart.

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3- Breakdown of red blood cells (RBCs)
Red blood cells are break down in liver after 120 days. The remains of RBCs are used to produce bile.

4- Storage of glycogen
Extra glucose from the blood is stored in liver in the form of glycogen. When there is excess of glucose in the blood insulin is secreted which carried insulin to liver and store it in the form of glycogen.

5- Excess of protein is converted into urea.

6- Storage and modification of vitamin A and K.

7. _____

(a) Increasing level of SO_2 and NO_x

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Sulphur dioxide

Sulphur dioxide is a pollutant which is emitted in the atmosphere mainly from the burning of fossil fuels

NO_x (Oxides of Nitrogen)

It is also a major pollutant in the atmosphere and it causes severe effects in the form of air pollution.

SO_2 and NO_x as threat. Why?

Oxides of Nitrogen and Sulphur are harmful for human health because it cause eye irritation, breathing problem and cause acid rain.

Acid Rain

The rain which has lower PH i.e less than 6 is called

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acid rain. How the acid rain is formed?

Acid rain is formed when the oxides of sulphur and nitrogen mixed with rain water and form sulphuric acid and nitric acid respectively. These acids were carried out by rain water on the surface of the ground.

$2SO_2 + O_2 \longrightarrow 2SO_3$

Sulphur dioxide, oxygen, Sulphur trioxide

$SO_3 + H_2O \longrightarrow H_2SO_4$

water, Sulphuric acid

$NO_2 + H_2O \longrightarrow HNO_3$

Nitrogen oxide, water, Nitric acid

Effects of Acid Rain

Acid Rain has the following negative effects.

1- It ruins the building made up of

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ceramics

2. make the soil acidic.

3- Affect the vegetation.

4 Poisonous water affect aquatic life

5- Acidic rain affect fabric and metal.

Conclusion

The increasing amount of SO_2 and NO_x is a threat for human health. It also affects the life on earth in the form of acid rain. Acid rain affect vegetation, aquatic life, metal and fabric.

(b) Significance of GHE and enhanced GHE

Green House gases Emission (GHE)

Greenhouse gases emission is

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the emission of green house gases. The greenhouse gases include carbondioxid ((O_2)), methane ((NH_4)), Oxides of Nitrogen (NO_x) and CFCs. These greenhouse gases form a blanket on atmosphere. These greenhouse gases increased in atmosphere because of the anthropogenic activities.

Significance of Greenhouse gases emission

Greenhouse gases are required for the normal temperature of the earth. The balanced and required amount of greenhouse gases keep the atmosphere of the earth warm and protect the earth from extreme cold weather.

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Enhanced Greenhous Gas Emission

The increased amount of greenhouse gases cause the devastating effects. The increased amount of greenhouse gase trap the heat in the atmosphere. This trap heat increase the temperature of of the earth global. It cause the phenomenon called global warming.

Effects of global warming

1- Global warming fast the melting of glaciers which produces flood and causes shortage of fresh water.
2- Droughts are more frequent.
3- Forest fire becomes frequent
4- The sea level is rising.
5- The coastal areas have threat to be submerged.