

Question No. 1

A. Explain the working of human heart:

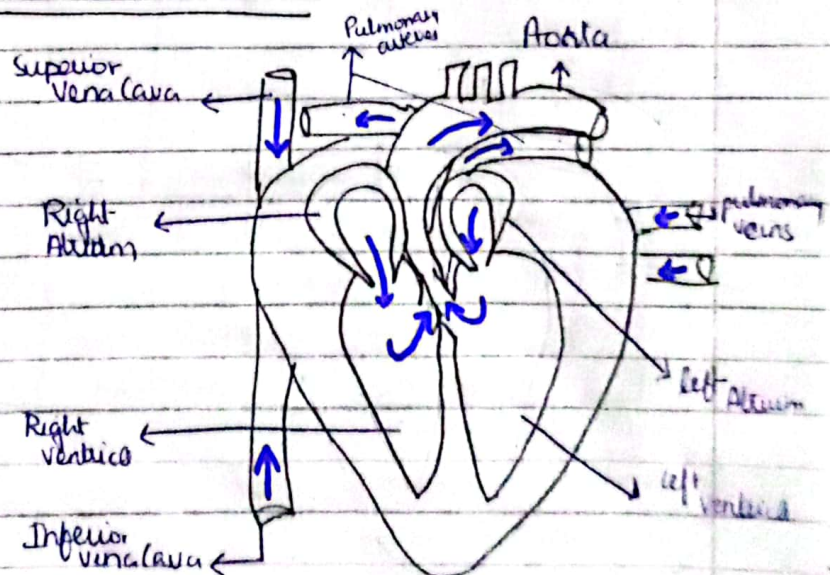
Blood Circulatory System:

Heart is the pumping machine which delivers blood to different body parts and then back to lungs to oxygenate it.

"Cardiovascular system is a network of heart and blood vessels responsible for delivery/flow of blood around the body."

A normal human heart pumps around 20,000 litres of blood daily.

Functioning of Human Heart:

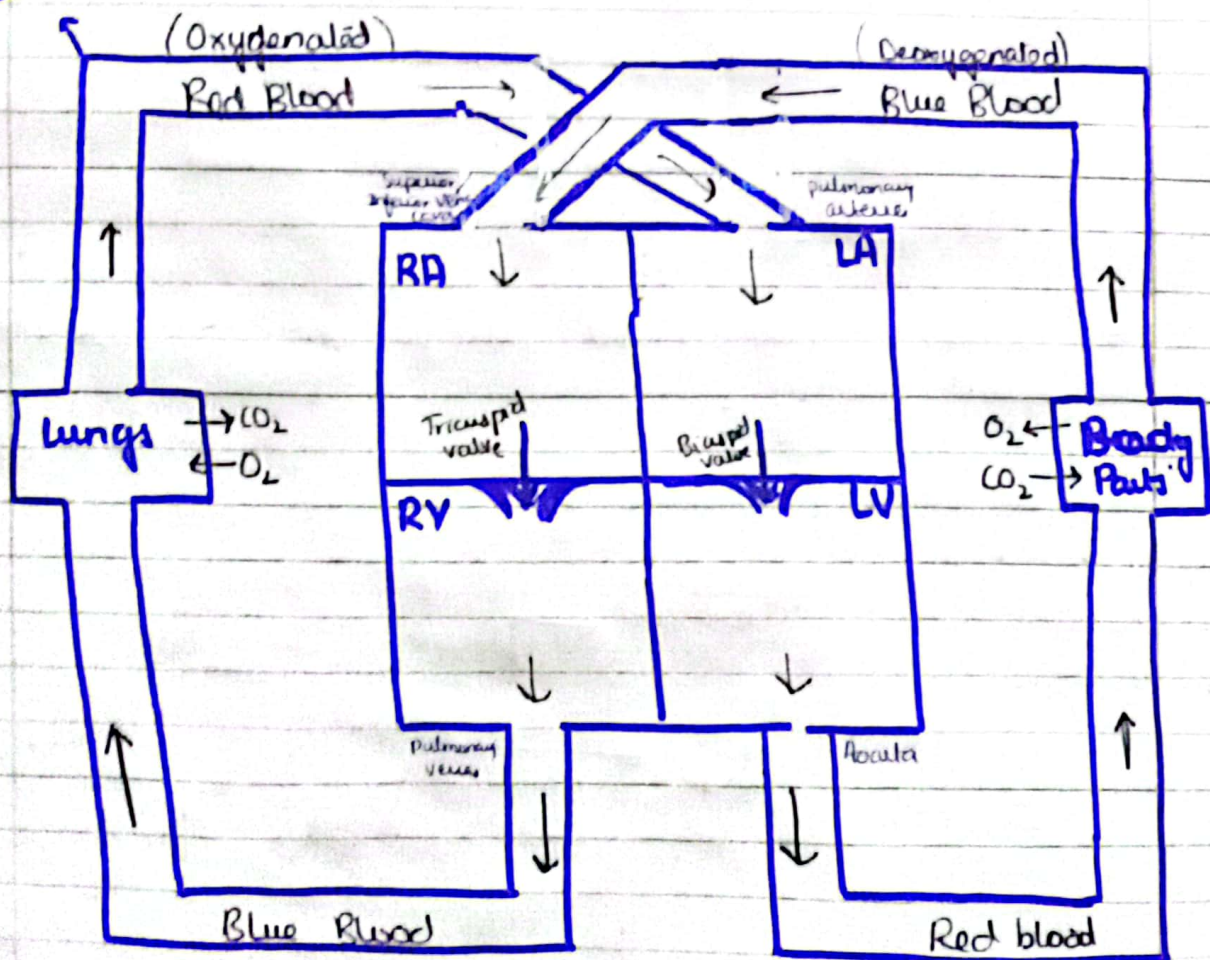


A human heart pumps oxygenated blood to body, receives deoxygenated blood from body, sends it to lungs for oxygenation.

receives and send oxygenated blood to body again. This cycle continues. The sum of LUB (blood to lung) and DLB (blood to body) makes one heartbeat.

The heart receives ~~the~~ oxygenated blood from ~~body~~ lung through pulmonary veins into the left atrium.

Blood Vessels.



Blood Circuit.

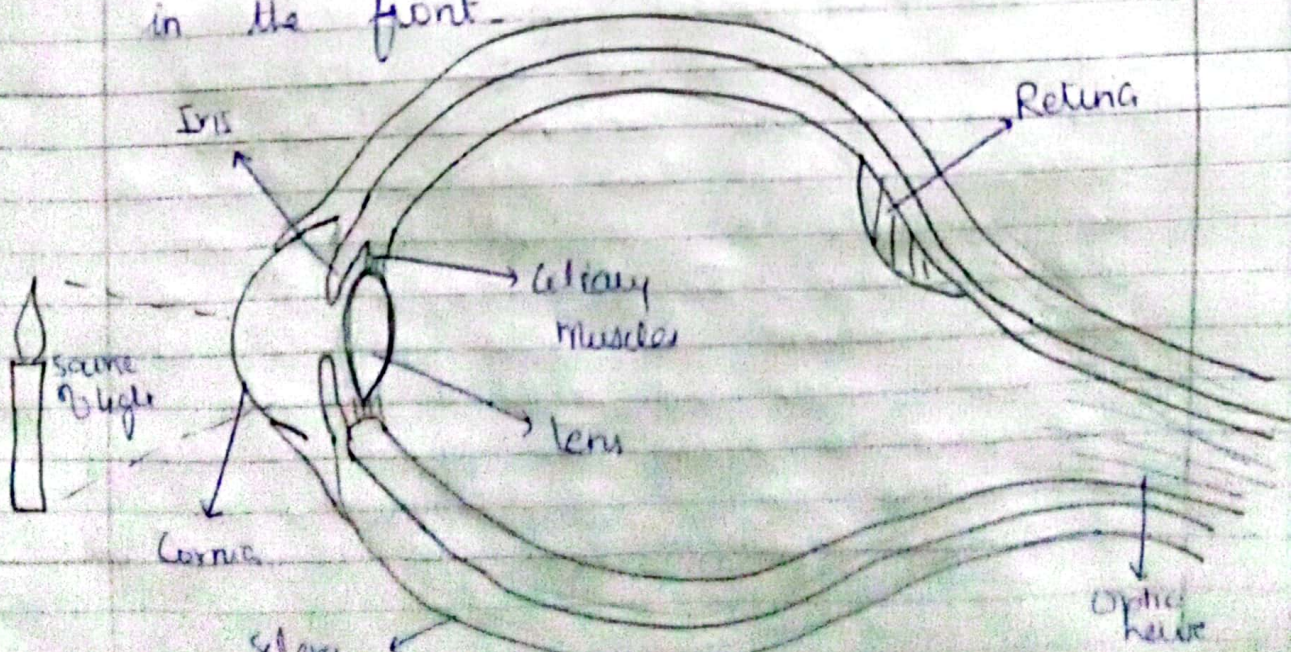
atrium, it then moves to the left ventricle and is pumped to different body parts through Aorta. At the same

time, the right atrium receives deoxygenated blood from body through superior and inferior vena cava and pumps it to right ventricle. The right ventricle pumps the blood to lungs through pulmonary veins for oxygenation. The blood (Oxygenated) is then received from lungs through pulmonary arteries in left atrium and the cycle continues.

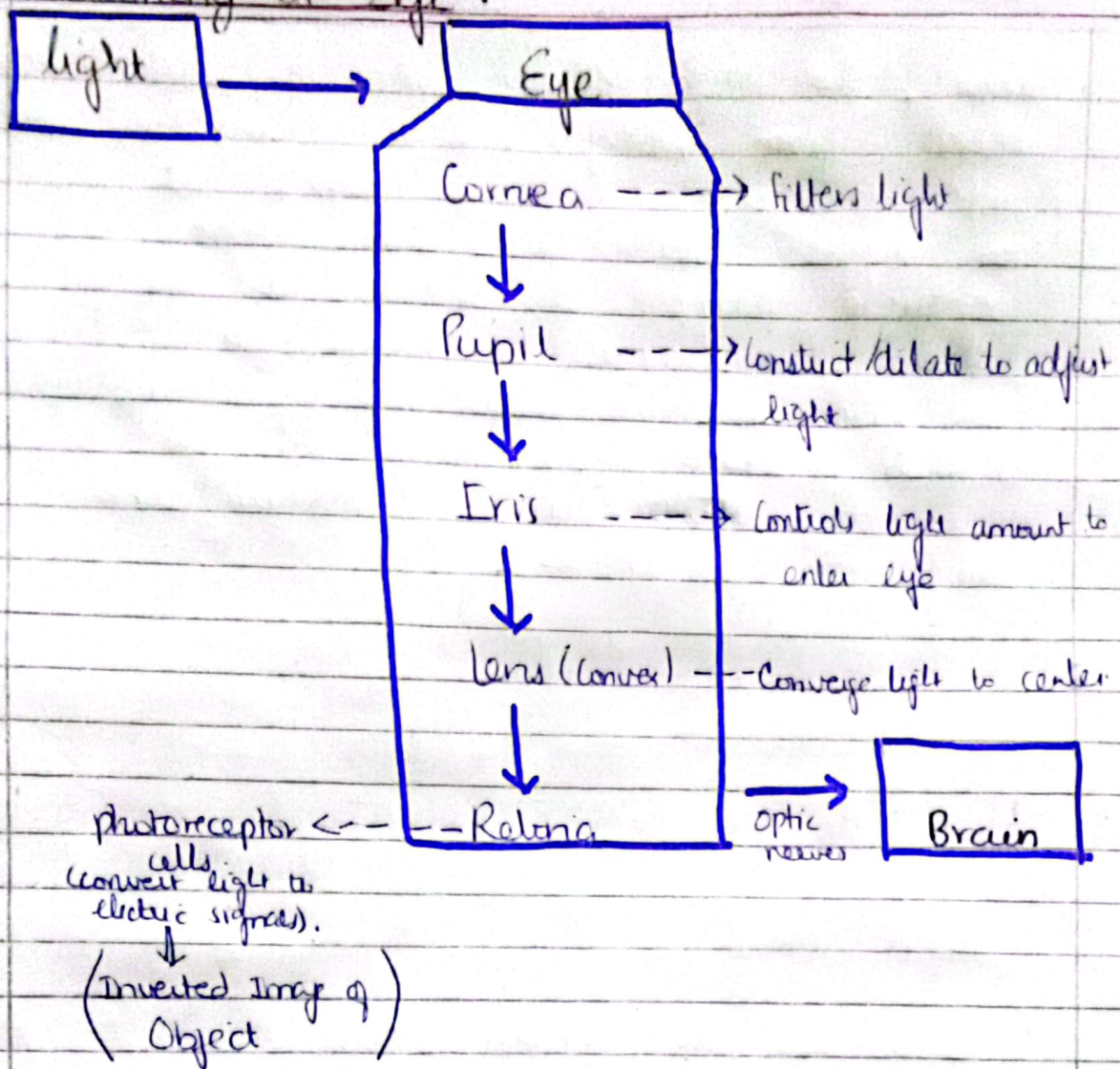
B. How do we see? Explain.

Human Organ for Sight - Eyes:

Eyes are the human organ which receives light signals, turn it into electric signal and send to the brain which helps in perception of the view in the front.



Functioning of Eye:



When light enters through Cornea of the eye, the pupil adjust the size and Iris permits the amount of light to enter. The light then falls on retina at the backside of eye and forms an inverted image. The photoreceptor cells in retina convert the light signals into electric signals and sends it through optic nerve to brain. The brain perceives and builds an image of the object. Vision therefore is dependent upon eye-brain connection.

C. Why biofuels are important? How they can be produced?

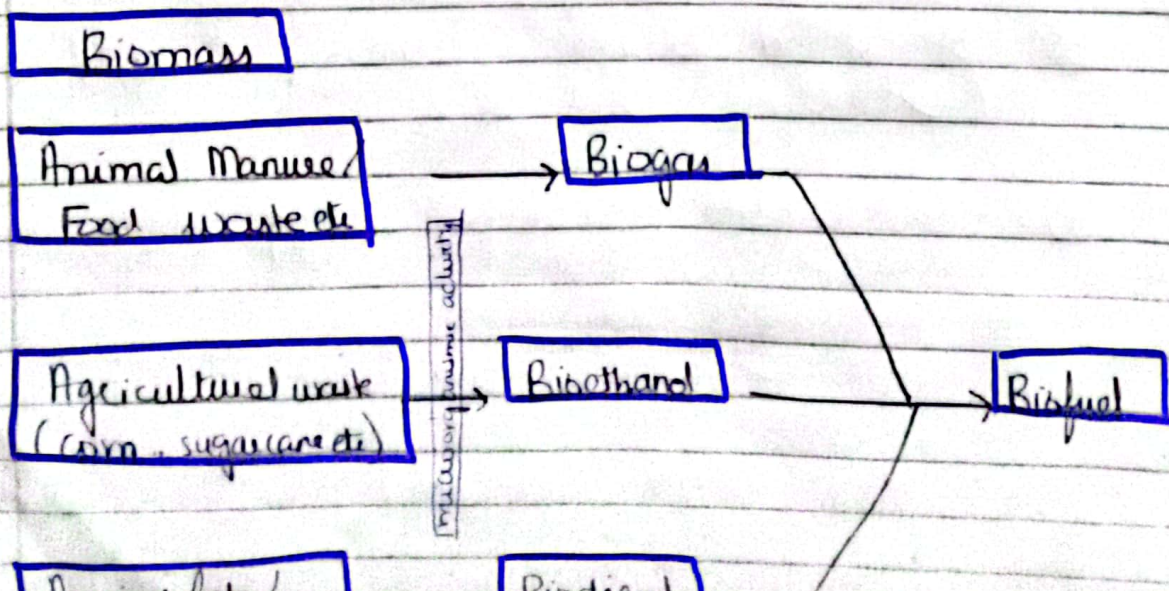
Biofuels:

"Biofuels are a renewable energy source derived from living organism / material"

They are an eco-friendly energy source
Most common example is biogas, biodiesel etc

Production of biofuel:

Biofuel is produced from biomass in a shorter span of time as compared to non-renewable energy sources like fossil fuel. The most common method is fermentation of organic material and most common raw material is agricultural waste, plants or domestic biomass.



The fermentation of sugar and starch in biomass by microbes help generate liquid, gaseous form of fuel which is further converted and used as biofuel in vehicles, industries etc.

Significance of biofuel:

- ①. Produced in shorter span of time as compared to fossil fuels
- ②. Lesser carbon footprints and contribution to global warming
- ③. Renewable source of energy.
- ④. Contributing factor to rural economy.
- ⑤. helps counter the environmental pollution through fossil fuel burning.
- ⑥. It is a source of energy security (extracting fossil fuel).
- ⑦. Sustainable form of energy



D. Difference between Plant, Animal and microorganism cell.

	<u>Plant Cell</u>	<u>Animal Cell</u>	<u>Microorganism cell</u>
① <u>Cell type</u>	Eukaryotic	Eukaryotic	Prokaryotic
② <u>Nucleus</u> Present	Present	Present	Absent
③ <u>Membrane-bound Organelles</u> Present	Present	Present	Absent
④ <u>Cell wall</u> Present	Present	Absent	Present
⑤ <u>Vacuole</u> Large vacuole present in center	Large vacuole present in center	small vacuoles throughout the cell.	Present in some
⑥ <u>Centrioles Centrioles</u> Absent	Absent	Present (center)	Absent
⑦ <u>Plastids</u> Present	Present	Absent	Absent

Question No. 2

A. Why increasing levels of SO_2 and NO_x are considered as threat - Explain.

Introduction:

Sulphur Oxide (SO_2) and Nitrogen Oxide (NO_x) are the primary contributors to pollution (Air pollution). These are gases which without any chemical reaction are harmful for atmosphere and life within. They cause diseases (breathing problem, asthma, even death) in human and other life form and contribute to global warming.

Harmful effects of SO_2 - (Threatening level)

- ① It causes suffocation if inhaled
- ② Headache, nausea and unconsciousness
- ③ Breathing problem even death.
- ④ Contributes to Acid rain.

Harmful effects of NO_x :

- ① Dangerous for people with breathing problem (Asthma)
- ② Contributes to Acid rain.
- ③ High exposure may cause death
- ④ Irregular heartbeat and suffocation
- ⑤ Other health concerns

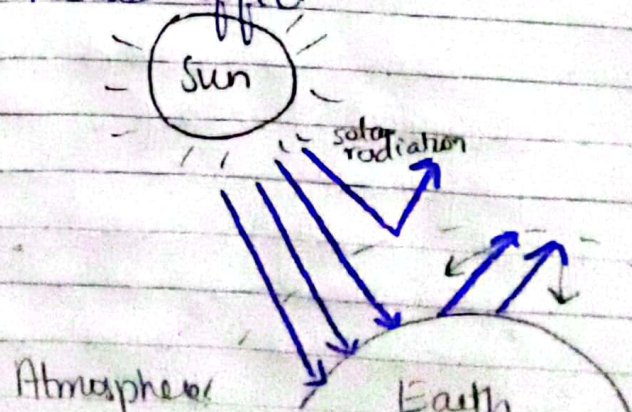
Why a cause of threat :

Fine particles in the atmosphere such as CO , NO_x and SO_2 etc are a result of emissions from different human and natural activity. They not only create immediate problems in human i.e. suffocation, breathing difficulty, nausea etc but also contribute to long term problems like climate change, global warming and threat to human life on Earth. The air quality index in Lahore, Pakistan, for example in the past month of 2023 was highest globally. Resultantly several people were hospitalized and complained about breathing difficulty. It also increases the risk of acid rains.

B - Significance of GHE :

Green-house Effect:

"The trapping of heat (from sun) to keep the Earth warm is called Green house effect."



Enhanced GHE:

"The production of human enhanced climate change which results in rise in temperature of Earth is called enhanced GHE."

Significance of GHE:

1. The earth atmosphere captures the sun rays to keep the temperature warm and inhabitable for life on earth.
2. Without greenhouse, the earth would be cold.
3. It helps in photosynthesis process in plants.
4. It sustains life on earth.

D. Liver is the chief chemist of the body:

Liver is called the "chief chemist" or "domestic factory" in body because it performs over 500 chemical functions in body, most of them including production of important biomolecules like proteins and sugar conversion.

- ① It maintains metabolism.
- ② It promotes detoxification through degradation of RBCs.
- ③ It regulates the blood glucose storage and level.
- ④ Hormone regulation
- ⑤ Protein metabolism.
- ⑥. Maintenance. Thousands of essential proteins, insulin, fibrinogen etc.

