

Question: 01

Q. Human heart

Human heart is the pumping organ of the body i.e. blood pumping. It is a muscle which is responsible for the circulation of blood in the human body.

Structure:

Human heart consists of four chambers — the two upper chambers right and left atrium and two lower chambers right and left ventricles.

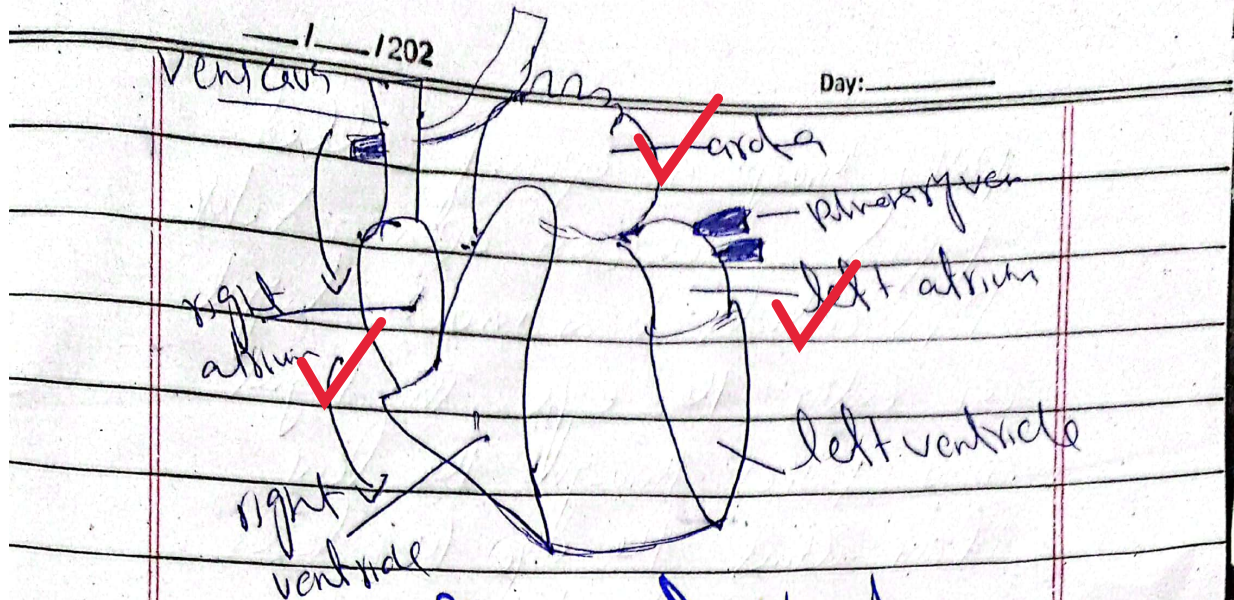
Valves are also present at junction of atrium and ventricles.

Working of the human heart

As we know Veins are responsible for the carrying of deoxygenated blood from body to the heart. Different veins arise from different parts of

The body. These veins open into a large vein called vena cava. This vena cava carries the de-oxygenated blood towards the right atrium. Right atrium gets contracted. Now the blood moves towards the right ventricle. From right ventricle there arises a pulmonary trunk which bifurcates into right and left arteries which in turn enter into right and left lungs. In the lungs oxygenation of blood takes place. From each lung the pulmonary veins arise which enter into left atrium. When the blood reaches left atrium it gets contracted and the blood will enter into left ventricle through valve. From there there is main artery called aorta. When left ventricle contracts bloods enter into aorta, from where blood is distributed to all the body.

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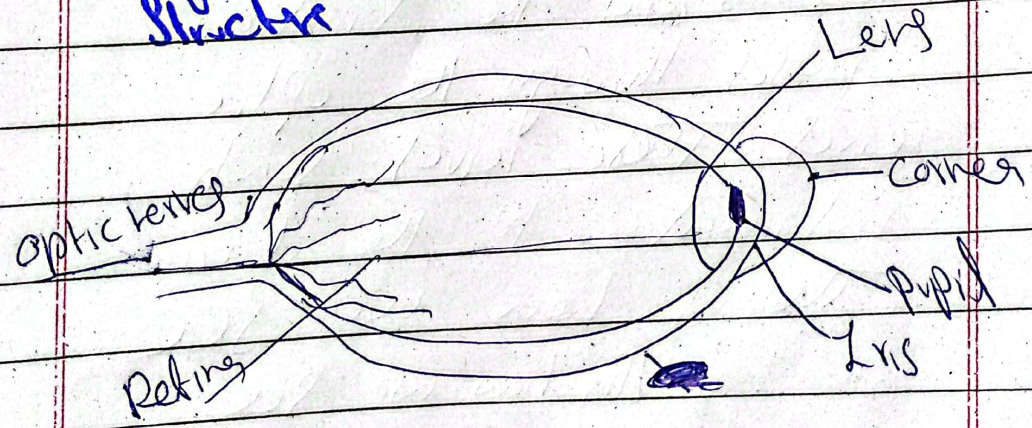
Structure of Heart

b. How do we see?

We see through our eyes
 Human eyes work like cameras
 lenses meaning that they focus
 light onto the retina.

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Eye Structure and Function



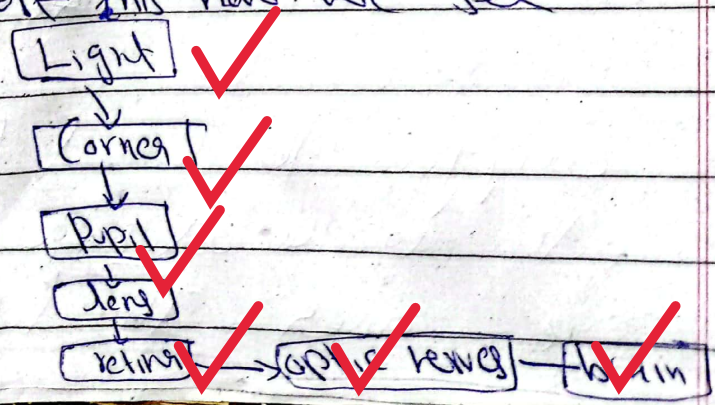
How do we see?

Energy in the form of light
 enter into the outer covering of
 eye - Cornea - This light then

Passes through an opening called pupil which can open and close. Pupil controls how much light can enter the eye. This light now passes through the lens. Lens allows the eye to focus on near or distant objects.

Now the light enters the ~~interior~~ retina which is the coating on the interior back of the eye. Retina contains Rods and Cones. Rods detect light and dark images. Cones are responsible for color vision. Signals from rods and cones to information passes through the optic nerves. These nerves send information to the brain.

This is how we see. In short this^{is} how we see



C. Biofuels

Biofuels are the purest and the easiest available fuels on the planet. Biofuels are obtained from biomass like wood and straw.

They can also be obtained from sludge, sewage and vegetable oil.

Types:

Biodiesel

Bioethanol

Biomethanol

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Production of Biofuel from Plant Products

The process is divided into three categories

(i) **First-generation**: These fuels are produced from edible sugar, starch and other food crops.

(ii) **Second-generation**: These are produced from non-edible plant matter such as woody biomass, agriculture

residue or waste

Third generation: These fuels are produced from algae and microbes.

Process/Preparation of Biodiesel

The steps involved are;

Filtration

Removal of water

Titration

Making of Sodium Meth Oxide

Heating mixture

Settling & separation

First of all waste vegetable oil is filtered to remove all food particles. Liquid is then washed and filtered. In the next stage, the water is removed by boiling at 100°C . In the next stage titration takes place, this will determine the amount of lye. In the next stage methanol is mixed with NaOH to produce sodium-meth oxide. Next the residue is heated and then at the left it can be mixed and allowed to cool down. The biodiesel ^{fuel} will be at the top and glycerin would be at the bottom. This glycerin can be separated.

Importance:

- (i) Less expensive than other fuels like the fossil fuels
- (ii) Promotes healthier population
- (iii) Helps in making cleaner environment
- (iv) Produce less emissions of CO_2 .

(v) Can be produced locally ✓

d. Differentiate between plant animal and microorganism cell.

Cell is the structural and functional unit of life. All organism consists of one or more cells. This can be plant, animal and microorganism cell. Let's discuss their difference

	Plant Cell	Animal Cell	Microorganism cell
(i)	It has cell wall	No cell wall	cell wall
(ii)	Size: smaller	smaller	Smallest ✓
(iii)	No centrioles ✓	Has centrioles	No centrioles
(iv)	Eukaryotes	Eukaryotes ✓	Prokaryotes
(v)	No lysosomes	Has lysosomes	No lysosomes
(vi)	Has Chloroplasts	No chloroplast	No chloroplast
(vii)	Has Mitochondria	Mitochondria	No mitochondria ✓
(viii)	No flagellum ✓	flagellum	flagellum ✓
(ix)	No capsule	No capsule	Slime capsule

Question no: 02

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(a)

Increasing level of SO_2 and NO_2

There has been an increase in the use of SO_2 and NO_2 .

They basically originate from industrial operations and fossil fuel combustion. These gases

are very toxic. They are ambient for air pollution.

They have impacted almost all the universe.

Threat to Human Health:

When both the oxides of sulphur and nitrogen are combined with water in the air they produce acid rain which is very toxic for human health.

They can contribute to heart and lung problems including asthma and bronchitis.

They can also damage skin and hair.

Threat to forest and vegetation

They when produce acid rain and this acid falls on the leaves and soils, these take away minerals from them.

Without these minerals they cannot grow properly.

Threat to surface water and Aquatic Animals

When the acid rain falls biodiversity reduces because the lakes and rivers become more acidic. This can damage fish and other aquatic animals also.

Environment in general

In general they can also cause to depletion of ozone layer, global warming, climate change and smog formation.

This further has some economic and social effects.

They can also contribute to global warming which further

enhanced the risks of natural disasters like flooding because they are also affecting the modern patterns ✓

d. Liver as a Chief Chemist

Liver is called as the Chief Chemist of the body because its role is complex and vital. It plays a major role in detoxification in the human body.

Functions:

Bile production: Liver helps in bile production. Bile helps the small intestine to break down and absorb fats, vitamins and cholesterol. ✓

Filters the blood: The liver filters the blood and remove compounds from it which are harmful.

Supports blood clots: The liver produces bile which is essential for vitamin K absorption. ✓

(iv) Metabolized Proteins

(v) Supports kidneys: Liver detoxifies many chemical poisons from body.

Other functions

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(vi) regulation of glycogen

(vii) hormone regulation

(viii) de-composition of red-blood cells

(ix) Maintaining body temperature & internal body energy

(x) Helps in manufacturing blood plasma.

c. Remote Sensing

Remote Sensing can be defined as a tool by which objects can be identified without direct contact through science and technology. It is used for observation of earth's surface or the atmosphere from air & space.

Importance

- (i) Measure ocean currents, winds, their direction and water level
- (ii) Keep an eye on the sediment
- (iii) Mapping land-use and cover agriculture, soil, mapping, city planning, vegetation, hydrology
- (iv) Water quality control can also be checked or monitored

(v) Light detection and ranging for vegetation.

(vi) Measurement of concentration of chemicals

(vii) Biodiversity assessment - Land scope for species

(viii) Forest-fire monitoring

(ix) Wildlife management

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Remote sensing is very important for the environment. Indeed