

## General Science Test - 2

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Batch # 001

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Q - 1

(a)

### Working of Human Heart

#### Introduction:

Human heart is a fist sized organ that pumps blood in the body all the time. Human heart pumps around 2000 gallons of blood, pumping around 100,000 times in a day.

#### Structure and Function:

Human heart has 4 chambers. The upper two chambers are called right atrium and left atrium. They are also known as auricles sometimes. The lower chambers are called ventricles; right ventricle and left ventricle.



## • Atrioventricular valves:

The valves present b/w atria and ventricles are called atrioventricular valves. The valve present b/w right atrium and right ventricle has 3 flaps of tissues and is called tricuspid valve.

The valve present b/w left atrium and left ventricle has 2 flaps of tissues and is called bicuspid valve / mitral valve.

## • Sub-lunar valves:

The valves present between ~~4~~ ventricles and arteries are called sub-lunar valves.

The valve present b/w right ventricle and pulmonary artery is called pulmonary valve while the valve present between left ventricle and aorta is called aortic valve.

## • Function of these valve:

These valves open easily in the direction of blood but when blood tries to move back into atria



they do not let it go in the opposite direction.

• Flow of blood in the heart:

Blood enters into right atrium through superior vena cava and inferior vena cava and by the opening of tricuspid valve it enters into right ventricle. This blood is deoxygenated as it has been received from the body. This blood is pumped from the left ventricle into the lungs <sup>dy</sup> for oxygenation.

The blood then enters the left atrium after oxygenation in the lungs and by the opening of mitral valve, is pushed to left ventricle from where it is pushed to the body through aorta.

• Conclusion:

Human heart is one of the prime organs of the body that works by pumping <sup>oxygenated</sup> blood to the body.

while maintaining the deoxygenated  
blood by sending it to lungs



## Q-1 (b)

How do we see?

### • Introduction:

Human beings have this wonderful organ that helps them see the world. It is called eye. Human eye helps with the vision but sometimes the vision is impaired due to any disease of eye or aging.

### • Structure of eye:

Human eye is made up of intricate parts that work collectively to form image. These structures include:

- **Cornea:** Cornea is a transparent dome-shaped membrane that is present at the front of eye. 66% of the seeing capacity of the eye is due to cornea.

- **Iris:**

Iris is a muscular structure more like ligaments. It helps with the opening of pupil, it controls the entry of light into the eye.



by controlling the size of pupil.  
Iris is the colored part of the eye.

- Pupil:

Pupil is dark opening in the centre of the eye. It is where the light enters into the eye.

- Lens:

Each eye has a lens behind the pupil. It is a convex lens. The lens of the eye helps with the image formation by converging the light on retina.

- Sclera:

Sclera is the white part of the eye that we see in the mirror. This part protects the eye by tears formation.

- Conjunctive:

It is a protective layer present beneath the eyelid. It protects eyes from ~~the~~ outer particles.



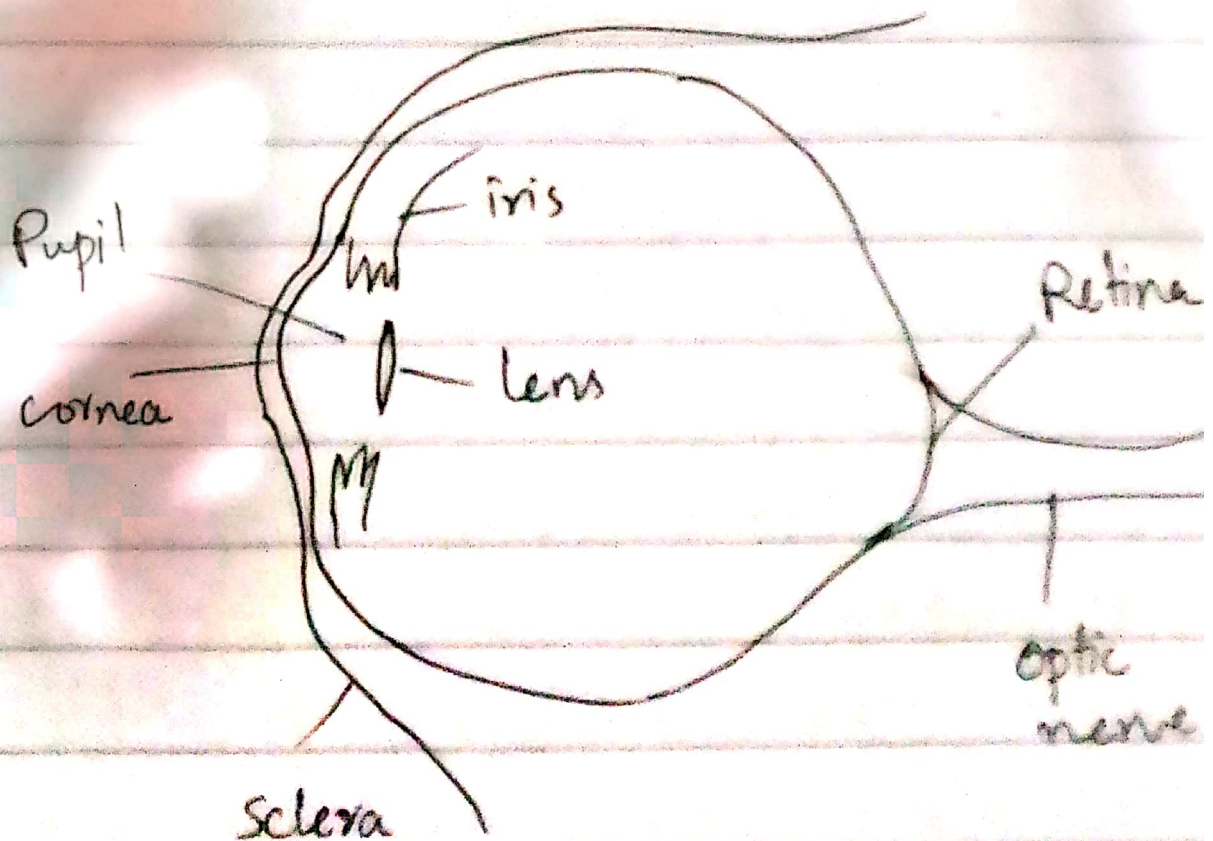
## • Retina:

It is a transparent membrane present on the back side of eye.

It is where the rod and cone cells are present and light is projected to form the image.

## • Optic nerve:

Optic nerve is attached to the retina on the back side of the eye. It connects the eye to the brain and projects the image there.





Q-1 (c)

## Biofuels , importance and production

### • Introduction:

Biofuels are very important as they are formed from the organic materials and do not pose extreme threat to the environment by increasing carbon footprint. Humans have been using fossil fuels since the industrial revolution and the CO<sub>2</sub> and other greenhouse gases emitted by combustion of fossil fuels have destroyed environment. In order to reduce global warming, the world needs to stop fossil fuels and they need to transition towards renewable energy resources like biofuels.

### • Biofuels:

Biofuels are a form of renewable energy resources, that are produced by organic material like fuelwood, plant wastes or animal wastes like dung.



## • Importance:

Biofuels can be in the forms of biodiesel or biogas. They are important in current scenario as the world is facing a grave problem of climate change as a result of over-use of fossil fuels. Fossil fuels are non-renewable energy resources and a source of greenhouse gases. This makes them unsustainable to use. So, the world is transitioning towards renewable energy resources biofuels are one of them. Currently, around 10% of the global energy need is fulfilled by the biofuels but in the future we'll see more and more production of these.

## • Production:

Biofuels are made from different raw materials. The source can be fuelwood, food crops, vegetable/plant waste, crops waste, animal dung etc.



- Biodiesel is made from Jatropha plant in different parts through a process called esterification.
- Biogas is made by the process of anaerobic fermentation of animal waste.

### Q-1 (d)

Plant, Animal and micro-organisms cell

Cell is the basic unit of life. The structure of cells ~~is~~ is different in different organisms. Microorganisms are prokaryotes and have very simple structure of the cell, while plants and animals are eukaryotes and have complex cells with more division of labor and more organelles. Plants, Animals and microorganisms are different in the formation of cell and size of the cells as well.



Animal Cell	Plant cell	Microorganism cell
<ul style="list-style-type: none"> <li>• Animal cells have a nucleus at the centre of the cell and DNA is enclosed in it</li> </ul>	<ul style="list-style-type: none"> <li>• Plant cells have a small nucleus pushed to a side due to big vacuole and DNA is enclosed in it.</li> </ul>	<ul style="list-style-type: none"> <li>• Microorganisms cell has DNA freely floating in its cytoplasm</li> </ul>
<ul style="list-style-type: none"> <li>• Eukaryotic cell</li> </ul>	<ul style="list-style-type: none"> <li>• Eukaryotic cell</li> </ul>	<ul style="list-style-type: none"> <li>• Prokaryotic cell</li> </ul>
<ul style="list-style-type: none"> <li>• Animal Cell has no cell wall</li> </ul>	<ul style="list-style-type: none"> <li>• Cell wall is present and is made up of cellulose</li> </ul>	<ul style="list-style-type: none"> <li>• Cell wall is present and is made up of peptidoglycan</li> </ul>
<ul style="list-style-type: none"> <li>• Small vacuoles</li> </ul>	<ul style="list-style-type: none"> <li>• one large vacuole at the centre</li> </ul>	<ul style="list-style-type: none"> <li>• small vacuoles are absent</li> </ul>
<ul style="list-style-type: none"> <li>• Divide by mitosis and meiosis happens</li> </ul>	<ul style="list-style-type: none"> <li>• Divide by mitosis</li> </ul>	<ul style="list-style-type: none"> <li>• Divide by binary fission</li> </ul>



Q-2 (a)

Levels of  $\text{SO}_2$  and  $\text{NO}_x$   
a threat

Introduction:

Increasing levels of  $\text{SO}_2$  and  $\text{N}_2\text{O}$  are considered a threat as they are harmful at high levels. These gases can cause acid rain by reacting with water droplets in the air <sup>and</sup> by converting into acids.  $\text{SO}_2$  and  $\text{NO}_x$  are the gases that can be easily converted into acids and then through rain can cause damage to the environment and living and non-living beings.

• Causes of increase in level:

These gases are released into the atmosphere by the combustion of material in factories and by burning of fossil fuels in the vehicles.



## • Acid rain and damages:

When  $\text{SO}_2$  and  $\text{NO}_x$  react with water they convert into  $\text{H}_2\text{NO}_3$ ,  $\text{H}_2\text{SO}_3$ ,  $\text{H}_2\text{SO}_4$  etc and when rain falls on the earth these acids become part of it. They pose threat to living organisms like:

- Crops: by hitting directly or by increasing acidity of the soil
- Water bodies: when acid rain falls into water bodies, it damages the living organisms like plants and animals like fish etc.
- Weathering of buildings:

These acids cause damage to the buildings by causing their weathering.

## • Human health:

They affect human health by being suspended in the air or by the rain as well. When humans inhale toxic substances they cause damage to the lungs and increase



Q-2 (d)

"Liver is the chief chemist of the body."

Liver:

Liver is one of the most vital organs of the body. It is the main factory of the body that performs important function of the body to keep it healthy.

Liver is present on the right side beneath the diaphragm. It weighs around 3 pounds and is the second largest organ of the body. It has 4 lobes and is roughly triangular shape.

• Liver as chief chemist:

Liver performs several important functions in the body that helps in a wide range of



processes. The processes are as follows:

- Digestion Through Bile production:

The main function that liver performs is production of bile.

Bile is secreted into digestive system and is vital for the breakdown of fats so that they are easily digested

- Detoxification:

Liver performs the function of detoxification of body by removing toxic substances from the blood. Liver also performs the digestion of drugs.

- Managing Red blood cells:

Liver helps body retain healthy red blood cells by killing or removing old red blood cells.

- Storage house:

Liver performs as a storage house for extra vitamins and iron is also stored in liver which is necessary for the normal RBC's production.



- Glycogen storage:

Liver converts extra sugars in the body into glycogen which can be later broken down and used by body for energy.

Q-2 (b)

### Significance of GHE

- GHE or Green house effect is very important for maintaining the temperature of earth. GHGs like  $\text{CO}_2$  are the vital component of the shield that traps the heat energy inside the surface of the earth and creating the phenomena of green house effect.
- Green house effect traps the energy of the sun and stop the heat waves from going out of the earth in order to maintain a



good temperature for the survival of living beings on earth.

- Enhanced Green House Effect:

Enhanced green house effect means presence of excessive amount of green house gases like  $\text{CO}_2$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$ . The enhanced green house effect will increase the temperature of the earth by trapping excessive heat inside the surface of the earth. This causes global warming that is detrimental for all the organisms on the earth.

- Havocs of global warming:

Global warming caused by enhanced GHE in turn starts a chain reaction of destruction by processes like melting of glaciers, floods, loss of biodiversity, forest fires, rising sea levels, change in climate pattern affecting crops and normal functioning of life.



Q-2 (c)

## Remote Sensing

“Remote sensing is a process of collecting information about some on the surface of earth without being in contact with it ; from a large distance.”

Importance in environment:

- Collecting information about the impact of a disaster.
- Presence of <sup>Extant</sup> forest cover in an area
- Biodiversity assessment in an area
- Temperature changes in a large area i.e, sea