

National Officers Academy

SADIA

Roll No: 7844

General Science & Ability

Test # 2

LMS: 33192

21st Jan, 2024

Q no. 1

a- Explain the working of human heart.

Answer

Heart is a sack like pumping organ. It is enclosed in a double membrane sac called peri-cardial cavity. It is composed of special muscles called cardiac muscles.

Working:

All the oxygenated blood is ~~collected~~ collected from the body through veins. All the veins from body open into a large vein called vena cava. Vena cava pour its deoxygenated blood into right atrium of heart. Then right

atrium contracts and blood enters into right ventricle through valve. From right ventricle there arise a pulmonary trunk which is further divided into right and left pulmonary arteries which enter into right and left lung respectively. Then right ventricle contracts and blood through pulmonary arteries enters into lungs. In lungs oxygenation of blood takes place and from each lung there arise pulmonary veins which enter into left atrium. The oxygenated blood from lungs through pulmonary veins enter into left atrium. and then left atrium contracts and blood enters into left ventricle. From left ventricle there arise a main artery called aorta from where oxygenated blood is supplied into whole body.

b- How do we see? Explain.

Answer

Human eyes are "Camera-type eyes," which means they work like

camera lenses focusing light ~~onto~~ onto film. The cornea and lens of eye works like camera lens, while retina of eye is like film.

Coating on the interior back of eye is called retina. When light strikes the retina, two types of cells are activated. Rods detect light and dark and help to form images ~~in~~ under dim conditions. Cones are responsible for color vision.

The three types of cones are called red, green and blue, but each actually detects a range of wavelengths and not these specific colors. When ~~you~~ we focus clearly on an object, light strikes a region called fovea.

The fovea is packed with cones and allows sharp vision. Rods outside the fovea are largely responsible for peripheral vision. Rods and cones convert light into an electric signal that is carried from the optic nerve to the brain. The brain translates nerve impulses to form an image.

~~These~~ 3-D information comes from comparing the differences between the images and ~~is~~ formed by ^{an} eye.

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

Answer

Biofuels are purest and easiest available fuel on the planet. Also known as agro-fuel. They are classified into gas, liquid and solid form derived from biomass. As an example, biodiesel is an alternative fuel for diesel engines.

$\text{Oil} + \text{alcohol} \rightarrow \text{biodiesel} + \text{glycerin}$

Importance:

Cost: Biofuels have the potential to be less expensive than gasoline and other fossil fuels.

Source material: Oil is a limited resource that $\frac{1}{2}$ comes from ^{specific} materials, but including biofuels can be manufactured from crop waste, manure, and other by products. This makes it an efficient step for ~~res~~ recycling.

Lower carbon emission: When biofuels are burnt, they produce less carbon as output and fewer the toxins making them a safer alternative to preserve atmosphere. Biofuels can be responsible for lower air pollution.

Economic stimulation: Biofuel production will also increase the demand of suitable biofuels crops, providing economic stimulation to agriculture industry.

Security: Biofuels can be produced locally, which decreases the nation's dependence on foreign energy.

Process of production:

There are various form of biofuels and most of them are made through a detailed process having various stages. The process of manufacturing of biofuel ~~have~~ has following steps:

Filtering:

In this process, waste vegetable oil is filtered to remove all the food particles. This process is involved in

warming up a liquid and after this it can be filtered out with the use of coffee filter.

Removing of water: Water can be easily removed by making liquid boil at 100°C for some time.

Titration:

This process is carried out to determine the amount of ~~lye~~^{lye} that would be required. This stage is a crucial for this process.

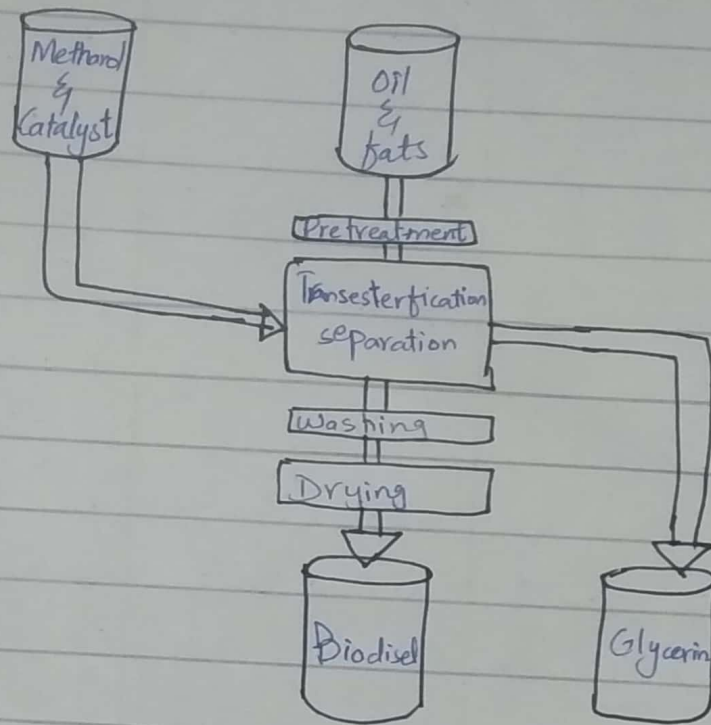
Preparation of Sodium-meth-oxides
Methanol is mixed with sodium hydroxide to produce sodium-meth-oxide. Quantity of methanol is used 20% of vegetable oil.

Heating and Mixing: Residue is heated at 120°F to 130°F after it is mixed well.

Avoiding splashing liquid, this step should be done carefully.

Settling and Separation: After mixing, liquid has to be allowed to cool ^{down.} After cooling, biofuel will be found floating at the top while heavy

glycerol glycerin would be found at bottom.



c- Differentiate between plant, animal and microorganisms cell.

Answer

<u>Plant cell</u>	<u>Animal cell</u>	<u>Microorganism cell</u>
Plant cell has cell wall made of cellulose.	It has no cell wall.	It has a cell wall.
It has plastids.	It has no plastids.	It has no plastids.

It has no centrioles.

Nucleus is not present in center of cell.

It has a large vacuole present in the centre

These are Eukaryotes.

It has a pair of centrioles, present near nucleus.

Nucleus is present in the centre of cell.

It has small vacuoles, present throughout the cell.

These are Eukaryotes.

It has no centrioles.

It has no nucleus.

It has no vacuoles.

These are prokaryotes.

Q no. 2

a- Why increasing ~~test~~ levels of SO_x and NO_x are considered as threat? Explain.

Largest source of SO_2 in atmosphere is burning of fossil fuels by power plants and other industrial facilities. Industrial processes such as extracting metal from ore, natural sources such as volcanoes, and heavy equipment that burn fuel with a high sulfur content causes the emission of SO_2 in air.

Effects of NO_2 and SO_2 pollution on health and environment are severe.

Hyper tension risk increases with long-term NO_2 exposure. NO_2 is highly poisonous when inhaled at high ~~test~~ levels and can cause respiratory illness, coughing, wheezing, dyspnea and other diseases. High amounts of NO_2 are harmful for vegetation and crops. NO_2 can fade fabrics and reduce visibility.

SO_2 emissions ~~appear~~ causes harmful environmental impacts such as acid rain

and soil acidification. NO_2 and SO_2 are highly responsible for acid rain, global warming and eutrophication. Wild life is also endangered because of these emissions.

Q In this way, NO_2 & SO_2 are causing health issues, environmental issues, decline in agriculture and food security is also threaten.

b- Explain the significance of GHE & explain the enhanced GHE.

Answer

Q- Liver is the chief chemist of the body. Explain.

Answer

Liver is the chemical factory performing over 500 chemical functions in a human body. The liver takes certain materials in our body and ~~turn~~ turns them into something else. For example, ~~it~~ it turns proteins and sugar into something that your body needs.

- Liver produces blood-clotting factors which help to heal in injury.

- It also stores vitamins, hormones, cholesterol and minerals. And it lets go these when our body needs them. Then these minerals flow into our bloodstream.

- It also produces a greenish fluid called bile. Tubes called bile ducts connect the liver ~~and~~ ^{to} other organs.

- The bile helps to digest fats in small intestine.
