

Question #1:

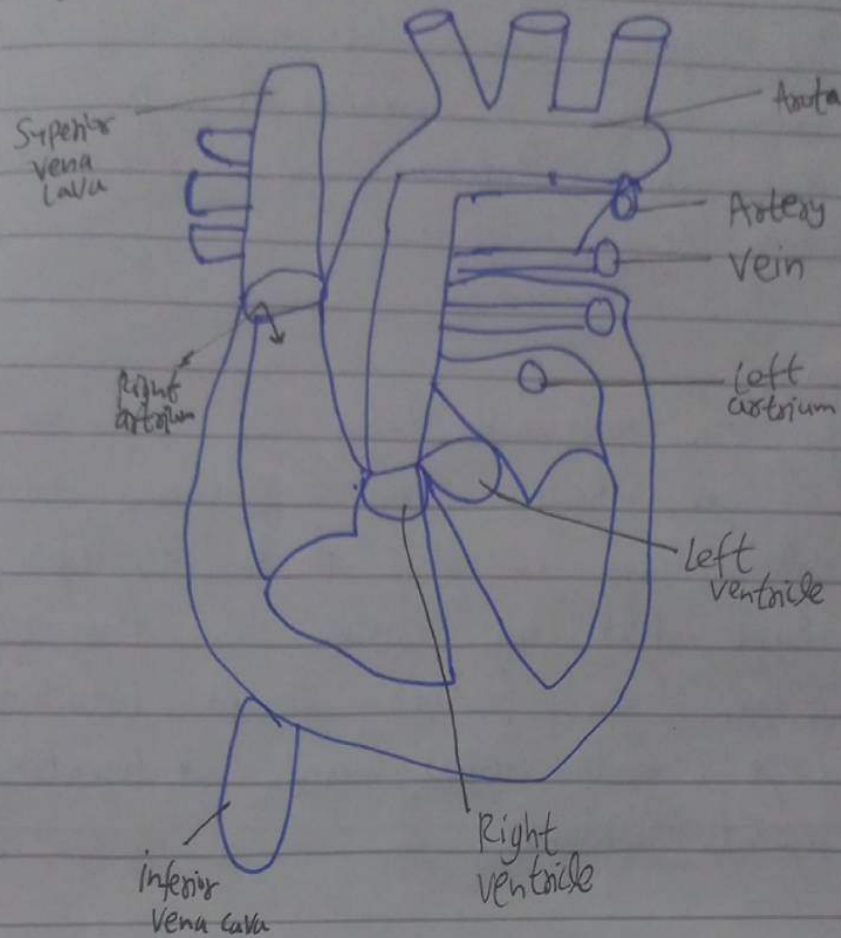
(a) Circulatory system and the working of the heart:

The circulatory system is the body's intricate transport network. It delivers oxygen, nutrients, hormones, and removes metabolic wastes. Heart pumps out blood and is one of the most vital organ in the human body.

Structures and Functions

The human heart is four chambered: two atria (upper chambers) and two ventricles (lower chambers). Deoxygenated blood from the ~~atrium~~ body flows in the atrium. Valves prevent backflow of the blood. The deoxygenated blood is exchanged for oxygen in the lungs and through the heart, flows into the entire body. Therefore, human heart is responsible for transporting oxygenated blood to the entire body.

Diagram of the human heart:



The diagram show how the deoxygenated blood enters from right atrium to lungs, where it is oxygenated and how the oxygenated blood flows from from left atrium to the whole body.

(b)

The internal structure of the earth has been molded by billions of years of geological evolution. It is divided into four layers.

1: Crust

This is the outermost layer of the earth. Biological activities and processes have only occurred on this part of the Earth. All life thrives on the crust. It has been further divided into oceanic crust (beneath oceans) and continental crust (landmass).

2: Mantle:

~~Bene~~ Beneath the crust, there lies the mantle. It is primarily composed of semi molten rock called magma. Slow convection currents here drive plate tectonics. The drifting of continents has occurred ^{due to} ~~in~~ this part of the earth. For example, the super continent of Pangea was separated into seven continents in the current era.

3:

3: Outer core:

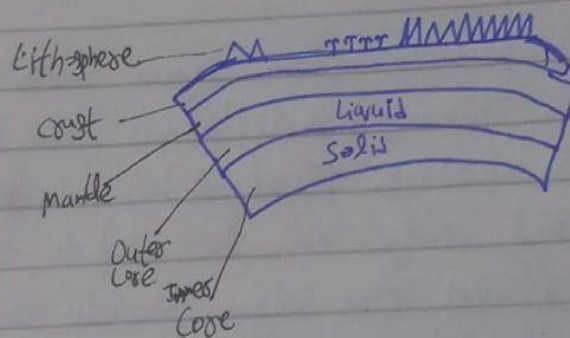
A molten metallic layer moves and generates Earth's magnetic field. This is called the

outer layers of the planet Earth.

4: Inner Core:

This is the most mysterious part of the Earth's surface. It contains a solid sphere of iron-nickel alloy. Immense pressure is the major reason behind its solid shape. The temperature of the inner core is extreme.

Representation of Earth's inner structure



The Earth's inner structure is responsible for the creation of mountains, continents, and volcanoes.

(C)

Bio-diesel and Bio-gas are renewable alternatives to fossil fuels, emerging from the biological sources rather than hydrocarbons. These alternatives have been presented as a way to adapt our energy needs to climate change.

Bio-Diesel

Biodiesel is produced from vegetable oils, animal fats, or used cooking oil. It is extracted through chemical processing and transforming the composition of the source material. The advantage of using biodiesel lies in its ability to burn clean. It emits lower greenhouse gases. Thus, it can be a resilient and a creative form of alternative to traditional fossil fuel.

Bio-Gas

Bio-gas is produced from organic waste and remains of humans, animals, plants, and other biological beings. Plant residue, animal waste, garbage, and sewage can be used to extract bio-gas. It uses this organic material and converts it into gas form. This gas can be used for cooking, electricity, and heating.

Renewable fuels provide ~~an~~ a way to transform waste, fats, and oils into energy. This can be helpful in fighting off climate change and restoring the ecosystem.

(d)

Earthquakes are caused by sudden shaking of earth's tectonic plates due to release of energy stored in earth's surface crust. The surface is impacted and settlements are at a risk of collapsing. Earthquakes also trigger landslides, tsunamis and structural collapses.

Causes of Earthquakes:

The most commonly attributed cause of Earthquake is the shift in tectonic plates. They move, collide, or slide past one another. This stress ~~pro~~ results in energy which is turned into seismic waves. Thus, shaking the land. The ~~point inside the~~ Epicenter is the point where Earth's surface is affected the most.

Instrument to Measure

Seismographs are widely used to record vibrations and Richter scale is used to measure intensity. For instance, the 2005 Earthquake in Pakistan was recorded at 7.6 on Richter Scale.

Question 3 (a)

Hepatitis is an inflammatory disease of the liver. It can be acute or chronic. The impact of Hepatitis can be mild or life threatening. This depends on the type of Hepatitis a patient has, and its duration.

Symptoms:

- ① Fatigue and Weakness
- ② Loss of Appetite
- ③ Nausea and Vomiting
- ④ Abdominal pain
- ⑤ Dark urine
- ⑥ Discoloration of eyes and skin
- ⑦ Fever

Causes:

The most frequent causes are viral infections. Hepatitis A and E spread through contaminated food and water. Hepatitis B, C, and D spread through blood transfusions.

Preventive Measures:

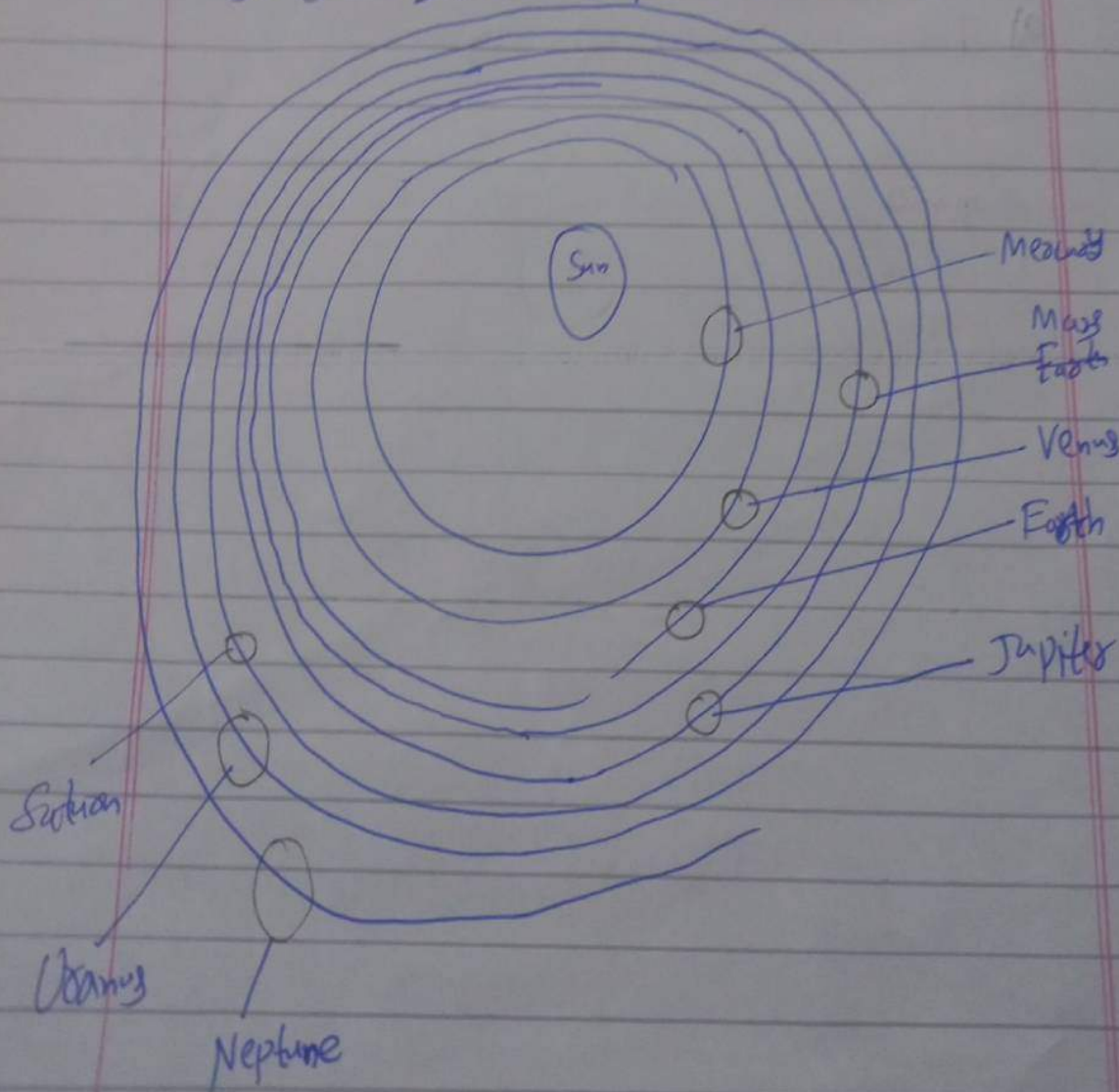
- ① Safe drinking water
- ② Proper Sanitation
- ③ Vaccines
- ④ Safe blood transfusions
- ⑤ Responsible sexual behavior

(b)

The Solar System is an organized celestial structure with sun at its centre. Planets, asteroids, and moons orbit around the sun. Sun produces energy through nuclear fusion.

Planets:

Around the Sun, eight planets revolve in circular motion. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, and Uranus revolve around the Sun. Two of these planets are gas giants, named Jupiter and Saturn.



(C)

Gaseous exchange refers to the movement of oxygen into the blood and the removal of carbon dioxide from it.

The lungs and circulatory system work together to achieve the process.

(d)

~~A solar eclipse occurs when~~

An eclipse occurs when celestial bodies are aligned.

Solar Eclipse

A solar eclipse occurs when the Moon passes between the Earth and the Sun, casting a shadow on Earth.

Total Solar Eclipse:

The Moon completely covers the Sun for the observers in the path of totality.

Partial Solar Eclipse:

Only a portion of the Sun is obscured.

Annual Solar Eclipse:

The Moon is slightly further from Earth and does not fully cover the Sun, leaving a glowing "ring of fire".

Lunar Eclipse:

The Moon enters Earth's shadow and Earth comes between Sun and the Moon.