

• Respected Sir, this is my first assignment of this subject ~~as well~~ as please evaluate it and tell me the changes to make. (improvements)

GSA: (2018)

Qno. 02:

(A) Describe different methods to estimate the age of the universe?

Scientists have estimated the age of the universe to be 13.7 Billion years using different methods which are:

- Calculating Cosmic Microwave background radiations:

Cosmic Microwave background radiations are radiations released by giant bodies during their cooling phase. By calculating these CMBR, scientists have calculated that the age of the universe is 13.7 Billion years.

- Using Hubble's Law:

According to Hubble's law: the accelerating speed between two giant bodies is directly proportional to the distance between those bodies.

By calculating distance between bodies in universe, scientists have concluded that the age of universe is approximately 13.7 Billion year.

" $a \propto d$ between masses"

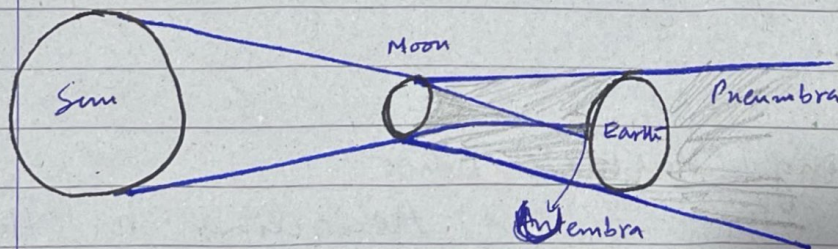
- Supernova explosions in adjacent galaxies:

With calculating the waves coming from adjacent galaxies because of explosion of supernovas, scientists have estimated the age of universe to be 13.7 Billion years.

~~~~~ x ~~~~~ x ~~~~~

- (B) Explain the formation of Lunar eclipse.

The Earth, Sun, and Moon are in a state of motion since their inception. <sup>The</sup> Earth is revolving around the Sun, while the Moon is revolving around the Earth. During this revolution, when the Moon comes between the Earth and the Sun, lunar eclipse develops.



The lunar Eclipse does not take place every month, although the Moon is continuously ~~on~~ ~~rev~~ revolving around the Earth, because of the  $5^\circ$  tilt of the Moon. Because of this tilt, the Moon sometimes goes above or below the Sun's shadow of light on Earth.

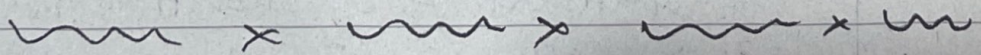


Whenever it comes directly in the sight of the light of Sun over Earth, Moon Eclipse occurs.

Types of Moon Eclipse:

There are three types of Moon Eclipses depending upon the shadow of Moon on Earth.

- Penumbra Type: The Moon is partially covered by the Sun's beam so it only disappears partially.
- Umbra Type: Moon has fully disappeared due to ~~S~~ direct in line of Sun's rays.
- Antumbra: Antumbra, when only an annular ring of Moon is appearing on Earth and the rest of it has been overshadowed by the Sun.



(C) Explain the term Dark Energy and Dark Matter:

Dark Energy and Dark Matter are constituents of the universe, which the scientists believe are present due to their affects on the masses in



the universe and the expansion of Universe, but ~~they~~ these entities have not yet been discovered.

→ Dark Energy: Dark Energy is a form of Energy that scientists believe is directly responsible for the expansion of the universe. It exerts ~~repelling~~ repelling force on the giant bodies in the universe, leading to their movements further from each other. Scientists believe the observable universe is constitute of 67% of Dark Energy.

→ Dark Matter: Dark Matter is another form of matter, rather opposite of matter. It exerts gravitational force on the giant bodies in the universe. Like Dark Energy, it has not been discovered, but because of the established gravitational force exertion in the universe it is believed that Dark Matter is a part of Universe. Scientists believe Dark Matter constitute 27% of the observable universe.

Scientists also believe that at the time of formation of universe, almost all the Dark Matter and Matter destroyed each other. Only little of both, especially the latter, remain today.



(d) Define the term Black Hole. What is expected inside it?

Black Hole by name depicts a large dark hole. According to "Astronomical International", Black Holes are large dark spaces in the Universe that have a very high gravitational force such as even light waves can not escape it.

Black Holes are formed from the collision of a star with another star or when a star runs out of fuel leading to its outer core falling over its inner core, this creates a hole of very high density in a very small space.

"Sagittarius A\*" is the Black Hole present in Milky Way.

→ What is expected inside a Black Hole?

Nothing can be said with surety of what is expected inside a black hole because all the laws of physics become useless at the center of Black Hole. Although many scientists believe



that Black Holes are a door to another universe, and the door on that side of the universe is called a White Hole, speculations only, no tangible proof.

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Qno: 03:

(A)

Describe different Causes and preventions of Polio?

Polio virus is a type of virus that affects the neural pathways supplying the muscular portion of the body, especially limb muscles and respiratory muscles.

→ Causes of Polio virus: Although there are three types of Polioviruses that mainly cause polio disease:

- Type 1 Poliovirus: Most common cause
- Type 2 Poliovirus: Extinct in wild.
- Type 3 Poliovirus: rare cases

The other causes of Polio can be:

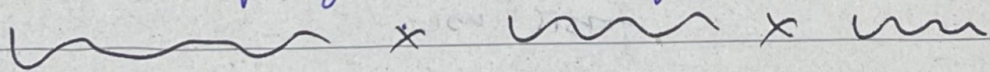
- Lack of hygiene: Polio virus spreads through feco-oral route and lack of hygiene can cause it.



- Mingling with Polio cases: Children in school or society can acquire polio through other children if they are affected.

→ Prevention of Polio: The following steps can be taken to significantly reduce the incidents of polio cases:

- Vaccination: Proper vaccination of children, both OPV and IPV.
- Sanitation: Maintaining proper hygiene to prevent contamination.
- Quarantine: Quarantine of established cases to prevent spread.
- Surveillance: Surveillance through proper sampling to see the presence of virus.

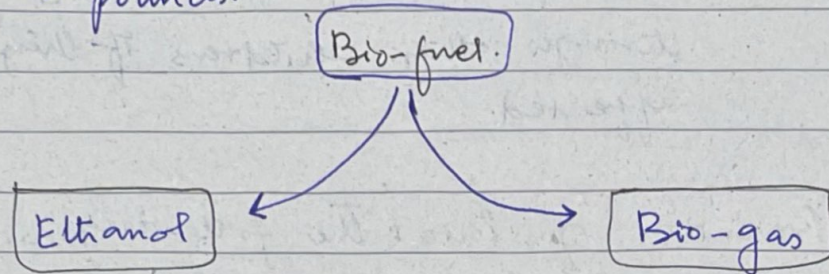


(B) Define the term "Bio-fuel". How is it helpful to promote clean energy?

Bio-fuel: Bio-fuel are fuels made from organic matter or biological substances. They are used as cleaner energy source in many parts of the world. Their examples are ethanol;



Bio-gas, and many other energy rich compounds.



These sources help in transitioning from fossil based sources.

→ Bio-fuel's role in clean energy:

- o Bio-fuel are made up of organic material such as sugarcane, tree debris, agricultural residues. These sources decrease mining activity leading to clean energy.

- o Bio-fuel produce electricity and heating, directly decreasing fossil use.

- o Bio-fuel such as ethanol is used in cars, promoting clean energy.

- o Bio-gas is now used widely as an alternate to LNG, promoting clean energy.



(C) Define Carbohydrates. Describe different steps to digest these in human body?

1. Carbohydrates: Carbohydrates are compounds formed from Carbon, hydrogen, and oxygen. They are energy compounds, widely used by all the living organisms for energy purposes.

Plant's main source of energy is Starch, a carbohydrate. While animals main source of energy is Glucose, a carbohydrate.

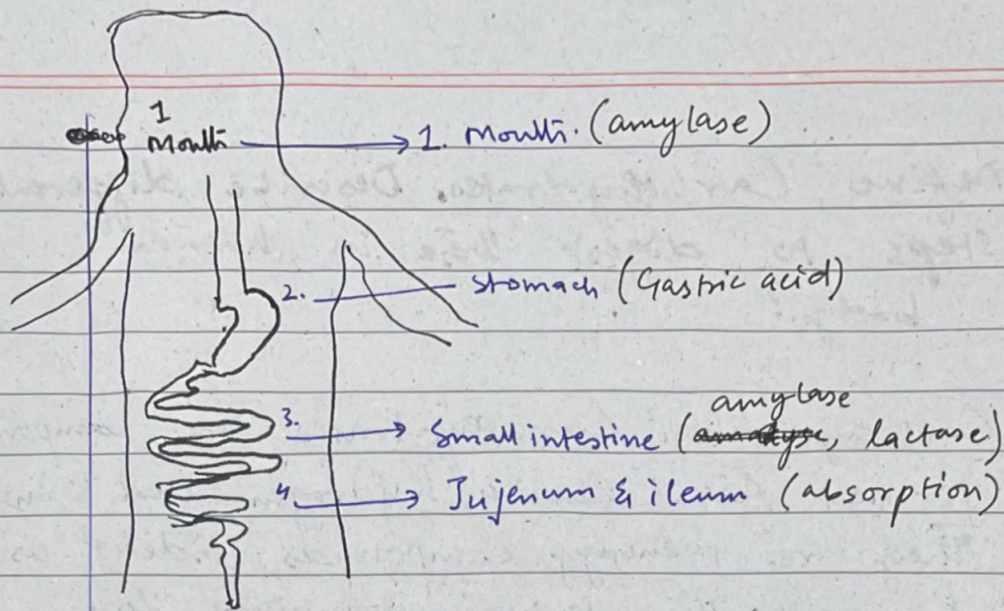
Carbohydrates are of different types based on their hydrolyzation or further division:

- Monosaccharides.
- Disaccharides
- Polysaccharides.

2. Different Steps to digest Carbohydrates in human body:

The digestion of carbohydrates start from mouth and ends in small intestines after which they are absorbed in human body:





→ Mouth: In mouth, food is chewed and broken down to smaller particles where salivary amylase breaks down complex carbohydrates into simpler ones.

Stomach.

→ ~~Small intestine~~: In Stomach, carbohydrates under the influence of gastric acid is further broken down.

→ Small Intestine: In small intestine, duodenal enzymes such as lipase and amylase break down the complex carbohydrates into smaller ones, easy for absorption.

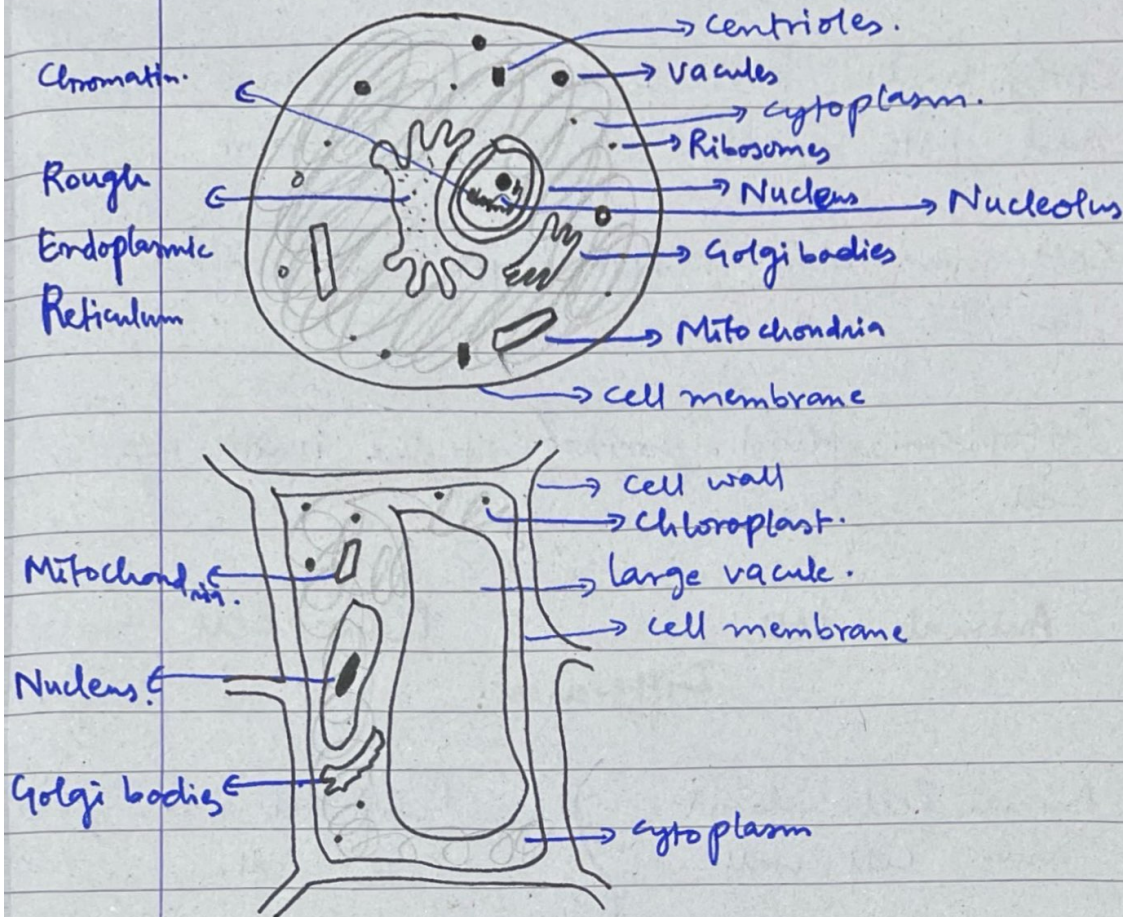
→ At last they are absorbed in jejunum and ileum of small intestine.



(D) Describe the 'Cell structure.' Write down at least three difference between an animal cell and plant cell?



# 1. ~~the~~ Cell Structure:



**Nucleus:** Nucleus is the "Brain of cell"; coordinates all the activities of cell.

**Mitochondria:** Power house of the cell. Produces ATP.

**Vacuole:** Formed by Golgi bodies, contains cell's food and waste material.

**Endoplasmic Reticulum:** Part of cell, produces Ribosomes.



Ribosomes: Proteineous part of the cell, help in translating mRNA.

Golgi bodies: Part of the cell, produces lipids and fats essential for cell membrane.

Cell membrane: Double layer outer cover of the cell.

Cytoplasm: fluid portion of the inside of cell.

Animal cell

Plant cell

Differences:

Animal cells do not have cell wall

Plant cells do have cell wall.

Animal cells do not have chloroplast

Plant cells do have chloroplast.

Animal cells have smaller and a lot of vacuoles

Plant cells have one, large vacuole.

Animal cells have centrioles

Plant cells do not have centrioles.