

## GSA-Mock

Part-II

Q#3:

(i) Global Warming is a wild beast and we all are poking at it which sticks, justify.

Ans: The term "global warming is a wild beast" implies that it is (global warming) a real threat. The phrase "we all are poking at it" means our collective actions to mitigate this threat are inadequate at best. Furthermore, global warming is a civilizational destroyer phenomenon, it is rather a shameful capitulated that human actions and intentions are not in harmony. The biggest polluter and major contributor of green-house gases gets away unabated. While the others like children of a lesser God are left in limbo to deal with the mess of not their making.

(ii) What is the origin of Universe how age of universe can be calculated?

Ans: Many astronomers consider the origin of universe back to the Big Bang. It means

that our universe, which is 13.7 billion years old, was at some point in history inside a small particle or bubble of atom, called "singularity". However, that atom exploded and resulted in the formation of universe. That began to expand and may still be very well on its expansion course. According to famous astronomer Stephen Hawking, the question of origin of universe is intricate. He adds, "The problem of the origin of universe is a bit like the old question: Which came first, the chicken or the egg? In other words, what agency created the universe? And what created that agency? Or perhaps, the universe, or the the agency that created it existed forever, and didn't need to be created." Stephen Hawking

### Age of Universe:

Some 13.7 billion years ago, the universe expanded and cooled, energy changed into particles of matter and anti matter. The two opposite matter particles destroyed each other. More stable particles protons and neutrons. After a short interval the temperature dropped to a billion degrees and neutrons couldn't transform into

protons to form a nuclei. Scientists have estimated the age of universe to be around 13.7 billion years old. The most pertinent of all is considered is Hubble's measurement of the age of universe. According to him the age of universe can be measured by using the formula:

$$t = \frac{1}{H_0}$$

In this formula  $t$  is called the Hubble time whereas  $H_0$  is known as the Hubble expression.



**(III) Write a short note on Semi-Conductors.**

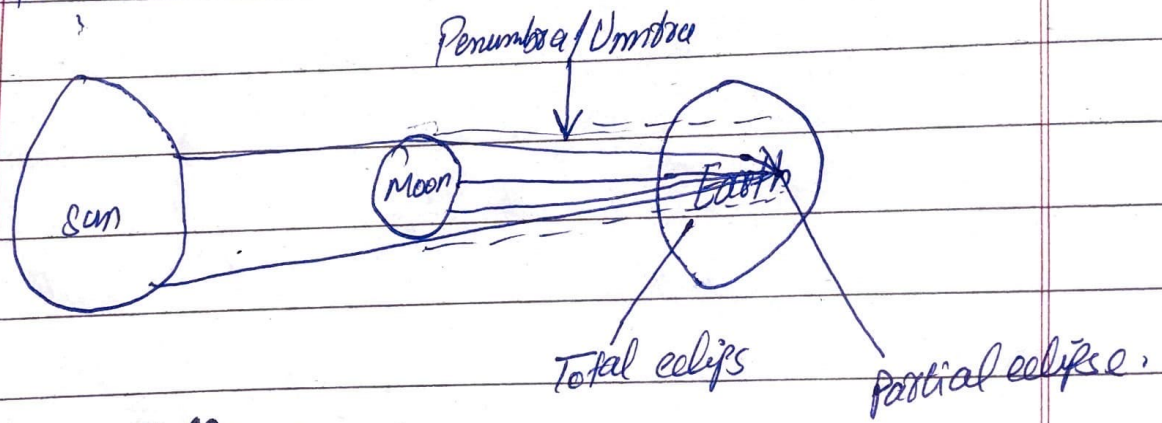
**Ans:** Semiconductors are generally described as materials which are used for conductivity between pure-conductors and non-conductors or insulators. They can be metallic or non-metallic in nature. Semiconductors can be pure elements like silicon and can also be compounds such as gallium arsenide, etc. The chief functions of semiconductors include amplification of signals (wifi-extenders) and switching as well as conversion of energy (in generators) etc. They are considered economically feasible, and used in manufacturing industries.

(d) What is eclipse? Distinguish b/w solar and lunar eclipse.

Ans: An eclipse is called syzygy. Syzygy is when two or more celestial bodies come in straight line configuration to each other. There are two types of syzygy or eclipse, solar and lunar.

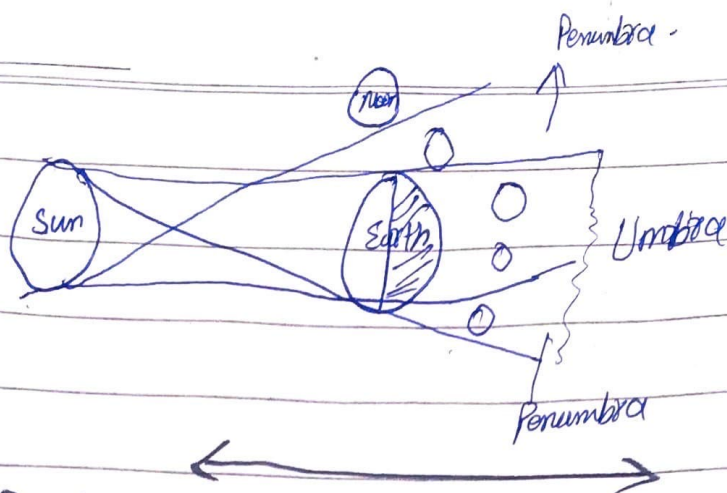
Solar Eclipse

Solar eclipse can be observed when sun is obscured by the moon during its rotational phase. During a solar eclipse, the moon casts its shadow on the surface of earth and this shadow consists of two regions: The Umbra and the Penumbra.



Lunar Eclipse:

The lunar eclipse is observed when moon appears dark due to the shadow of earth. There are three types of Lunar eclipses partial, full and penumbral.



Q# 4:

(a) Define the following:

### 1- Pesticides

The synthetic substances used for neutralising insects and other micro-organisms harmful to cultivated plants, crops and a nuisance to humans, are called pesticides. For example, mosquito killer is one of the most general pesticide.

### 2- Herbicides

The synthetic chemical substances used to control the unwanted growth of plants in cultivated fields are called herbicides. These substances are harmful to plants, thus their usage is restricted to unwanted vegetation only.

### 3- Insecticides

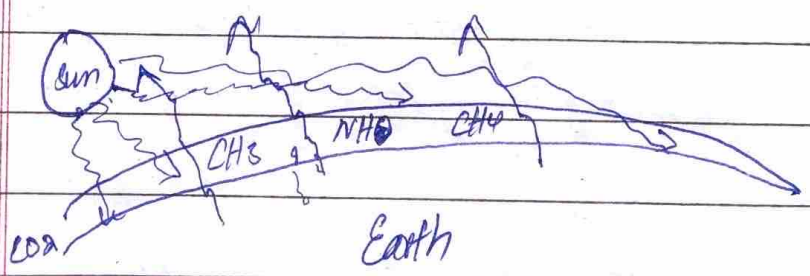
The substances used for killing insects and other arthropods are called insecticides.

## 4. Ceramics

Ceramics are synthetically prepared non-metallic solids that are composed of clay and hardened due to high temperature. Ceramics have properties which are partially metallic and partially non-metallic. Their application varies, for example, ceramics are good insulators, used in electrical appliances. Ceramics are cheaper and durable due to their anti-corrosion properties. Furthermore, ceramics are also used in medical equipments.

## 5. Green House Effect.

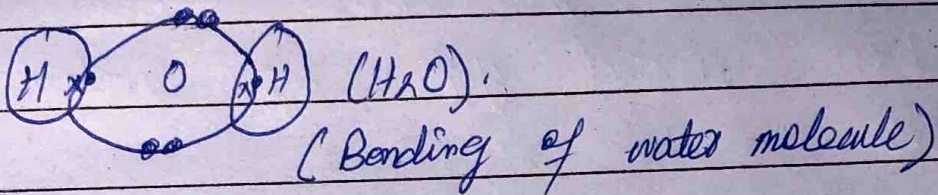
The 'Green House Effect' refers to a process of trapping heat in earth's layer. The ultraviolet radiations emitted by sun are trapped in a gaseous layer of earth. It prevents the surface of earth from heating. These gases are called the green-house gases.



(Green House Effect).

(ii) Explain bonding in water molecules.

Ans: The bonding in water molecules is called hydrogen bonding. It is the strongest type of intermolecular force. For hydrogen bonding to occur, there should be one molecule having a hydrogen atom covalently bonded to oxygen (the electronegative atom). Similarly, the oxygen atom should have a lone pair of electrons, as shown in figure



(iv) Advantages and disadvantages of AI.

AI (Artificial Intelligence) is the technological advancement in the field of engineering and robotics. In simple words AI is the machine with thinking abilities and which can perform all human functions (mechanical and cognitive).

**Advantages:**

- 1- Substitution of human labour.
- 2- Faster production of goods.
- 3- A medical revolution and miracle.
- 4- A communication enhancement tool.

## Disadvantages:

- 1- An economic suicide, causing mass unemployment
- 2- Rise in cyber crime.
- 3- AI empowered robotic weapons have made war <sup>deadly</sup> more
- 4- Skepticism of people towards AI, believing it may takeover humans. A fully dystopian reality awaits mankind in future.



**Note:** The mathematics portion has not been covered yet by batch 058-ISB.

