

GSA Past Papers 2017

PART - II

SECTION - I

ANSWER # 02

(A) FACTORS RESPONSIBLE FOR ENVIRONMENTAL

POLLUTION:

Following are the factors responsible of environmental pollution.

- 1- Air pollution
- 2- Water pollution
- 3- Land pollution

AIR POLLUTION:

When gas and chemical, in harmful amounts, spreads in the atmosphere, it causes air pollution.

The pollutant that causes the air pollution can be divided into two, primary pollutants, that directly effect the air for example carbon monoxide from cars, and secondary pollutants, compound result of primary for example smog.

WATER POLLUTION:

Any change or modification in physical, chemical, and biological properties of water detrimental to effect living thing is called water pollution. It includes contamination of water bodies (lakes, sea, river, groundwater, and ocean).

LAND POLLUTION

Land pollution is degradation or destruction of land by human activities - For example, coal mining, industrialization, use of herbicides, pesticides, and insecticides, and excess amount of solid waste.

(B) REASONS OF WATER-LOGGING IN PAKISTAN

Following are the reasons of water logging in Pakistan.

- 1- Heavy rain and floods
- 2- Bad practice of irrigation
- 3- Ineffective drainage system
- 4- Land topography

Heavy Rains and Floods:

Heavy rains and increasing number of floods cause excess of water in urban and agricultural lands that ultimately cause water logging.

Bad Practice of Irrigation:

Farmers usually perform bad practice, providing excess amount of water to the soil which causes water-logging on ground surface.

Ineffective Drainage System:

Ineffective drainage system is one of the main reason. Lack of modern infrastructure for drainage causes water logging.

Land Topography:

Depressed lands that have low ground level are one of the main reasons of water logging in Pakistan.

(C) OZONE DEPLETION:

In 1970's scientists discovered a chemical naming chlorofluorocarbons or CFCs that pose a significant threat to ozone layer. These releasing chlorine containing chemical rise in Earth stratosphere and broken down by sunlight, where upon the chlorine reacts with ozone molecules and destroys them.

Prevention:

In 1987, Montreal protocol was proposed that aims to control the emission of CFCs and HCFCs. Individual can also contribute by using recycled product or by reusing them, decreasing the demand of harmful products.

(D) ACID RAIN:

Acid rain is a broader term used for mixture of wet and dry deposition from atmosphere containing sulphuric and nitric acid.

Dangers Associated:

- 1- Acid rain dissolves in soil and washes the important nutrient, impeding the growth of plant.
- 2- Acid rain directly attacks trees, eating holes of waxy coating leaves and needles.
- 3- Acid rain directly falls into water bodies, causing contamination of them and unfit for use.

ANSWER #04

(A) MIRAGE

Mirage is an illusion that produces a false layer of water on desert or on road. It usually occurs in hot day. This happens because of the atmospheric refraction and internal reflection of light. When light comes from the sky, from a low-temperature layer, it enters into high temperature layer and light also suffers an internal reflection which causes a false layer of water at short distances on desert or road. The false layer makes human believe that something exists but in reality it doesn't exist at all. It mostly occurs in desert due to extreme hot weather conditions.

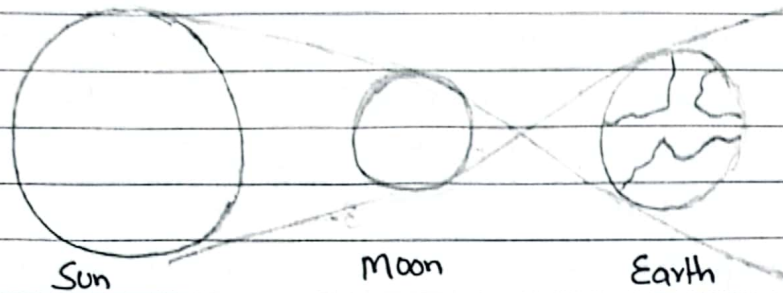
(B) SOLAR ECLIPSE

Earth and all the planets revolve around the sun in their orbit. In turn, moon revolves around the Earth. So there comes a time when all these three heavenly bodies align in a straight line and that's why an eclipse occurs. If moon comes between the sun and Earth, blocking the sunlight, its shadow falls on the earth and this phenomenon is known as solar eclipse. It has 3 types:

- 1- Partial: When moon doesn't align with the sun properly and almost half of the sun is visible.

2- Annular: When moon covers the sun, but the edges of the sun are still visible, making a ring shape.

3- Total: When moon totally covers the sun and blocks the sunlight to reach to the Earth.

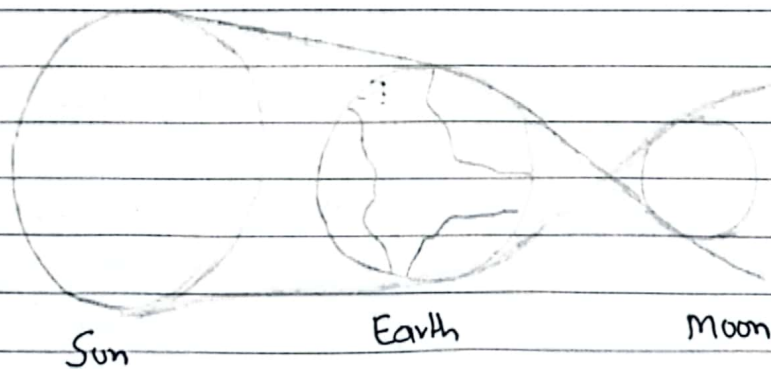


LUNAR Eclipse:

Similarly, when Earth comes in between the sun and moon so the phenomenon occurred is known as lunar eclipse. There are the following types of lunar eclipse.

1- Partial: When moon partially comes under the Earth's shadow, and moon is still receiving the light from the sun.

2- Total: When moon fully covered up under the shadow of Earth and sunlight is totally blocked.



DATE _____

DAY

M	T	W	T	F	S	S
---	---	---	---	---	---	---

C) EFFECTS PRODUCED DUE TO ROTATION & REVOLUTION OF EARTH

Rotation:

- 1- Earth's rotation causes day and night
- 2- Earth is in spherical shape due to which, when it rotates its half part receives sunlight and remaining part remains dark.
- 3- The part which receives sunlight, experiences day and the dark one experiences night.

Revolution:

- 1- Earth's revolution causes seasons.
- 2- Earth's revolution gives impression that sun moves North to South of Equator.
- 3- On March 21 and September 23, Sun directly faces equator. On these three days day and night are equal throughout the world. These days are also called equinoxes.
- 4- On June 21, Tropic of Cancer directly faces the sun. This is known as summer solstice. On this day Northern hemisphere experiences longest day and Southern hemisphere experiences longest night.
- 5- On December 20/22, Tropic of Capricorn directly faces the sun. This is also known as winter solstice. On this day, Southern hemisphere experiences longest day and

Page No. _____

Northern hemisphere
experience longest
night.

D) Following are the reasons behind the generation of AC ~~current~~ on power stations.

1. The production cost of AC is less than DC.
2. It is easy to step-up and step-down AC due to the transformer which is not possible in DC.
3. Electricity in houses, comes from the few located power stations. Chances of line losses are lower than DC in AC.
4. Major household appliances like fridge, air conditioner, washing machine etc. are still on AC and cannot work properly on DC.
5. Peak current value of AC is more than DC.

2018

PART - II

SECTION - I

(A) AGE OF UNIVERSE

Scientist estimates the age of universe as the occurrence of Bigbang about 10 to 20 billion years ago. These are the following ways to measure the age of universe, as per NASA:

- 1- Globular Cluster
- 2- Hubble Constant

GLOBULAR CLUSTER:

Astronomers study the Globular Cluster to determine

the age of ancient stars formed at same time. Globular Cluster is the dense collection of dense stars. The mass influences the age of stars; stars with more mass burn brighter and faster than who have less mass. Astronomers have estimated that the age of globular cluster stars is 11 billion to 18 billion, indicating to the age of Universe.

HUBBLE CONSTANT:

Hubble constant measures the expansion rate of the Universe. Cosmologists use this rate to extrapolate it to the Big Bang and determining the age of the Universe. This extrapolation depends upon the current density and composition of Universe.

(B) LUNAR ECLIPSE

The cosmology has revealed that Earth and all other planets revolve around the sun in their respective orbit. In turn, Moon revolves around the Earth. There comes a time when all these heavenly objects align in a straight line and covering each other precisely, adhering to the Quranic verse:

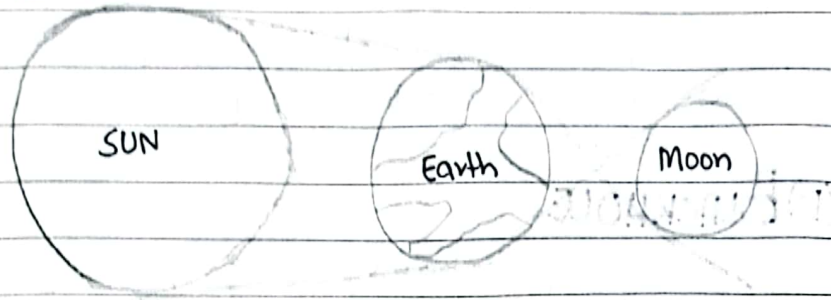
"We have created all things in precise measures"

-54:49

So, when Earth comes between sun and moon, blocking the sunlight of the moon, the lunar eclipse occurs. There are two types of lunar eclipse:

1-Partial: When a part of the moon comes under the Earth's shadow.

2-Total: When a full moon comes under the Earth's shadow.



c) DARK MATTER

Dark matter is like an ordinary matter. It contains mass and occupies space but, it doesn't absorb, radiate, or reflect light. At least not on a level that it can be detected. Astronomers claim that 28% of the universe is made up of dark energy. Until 20th Century, Astronomers didn't know that dark matter exists. In 1930s, a Swiss astronomer, Fritz Zwicky coined the term dark matter by studying the clusters of galaxies. In 1970s, US astronomer, Vera Rubin confirmed its existence by studying the rotation movement of galaxies. Astronomers claim that it spreads like a web throughout the universe.

DARK ENERGY

Dark energy is more mysterious than dark matter. It is estimated that 68% of the universe is made up of dark energy. In 1920s, astronomers knew that the universe is expanding but in 1990s, after

observing the collapse of distant object, it is claimed that the expansion rate of Universe ~~is~~ was low in the past as compare to now, which confirms the existence of a repulsive gravitational effect - expanding universe instead of pulling it back together - known as black energy.

(D) BLACKHOLE

Prof. Subrahmanyan Chandrasekhar is among the people that discover the blackhole. He calculated that star must collapse when they run out of fuel which is required for their fusion reaction, burning the light. The collapse of huge star results in Blackhole. It is tightly packed and highly dense.

What is inside blackhole?

The short answer is nobody exactly knows what is inside of it. & It is consist of two parts. which are the following

- 1- Event horizon
- 2- Singularity

EVENT HORIZON

It is beneath the surface. It is said that this is the surface which overwhelms the gravity of all other factors even a light cannot escape through it.

SINGULARITY

Singularity is the thing which is expected inside the blackhole. It is said that, it is indefinitely small and indefinitely dense.