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## GSA (Test #3)

-Arrosa

### Question #1

a) What is solar and lunar eclipse? Give the types of solar eclipse

### Answer

#### Eclipse:

The eclipse means obscuring of one astronomical object by another.

#### Solar eclipse

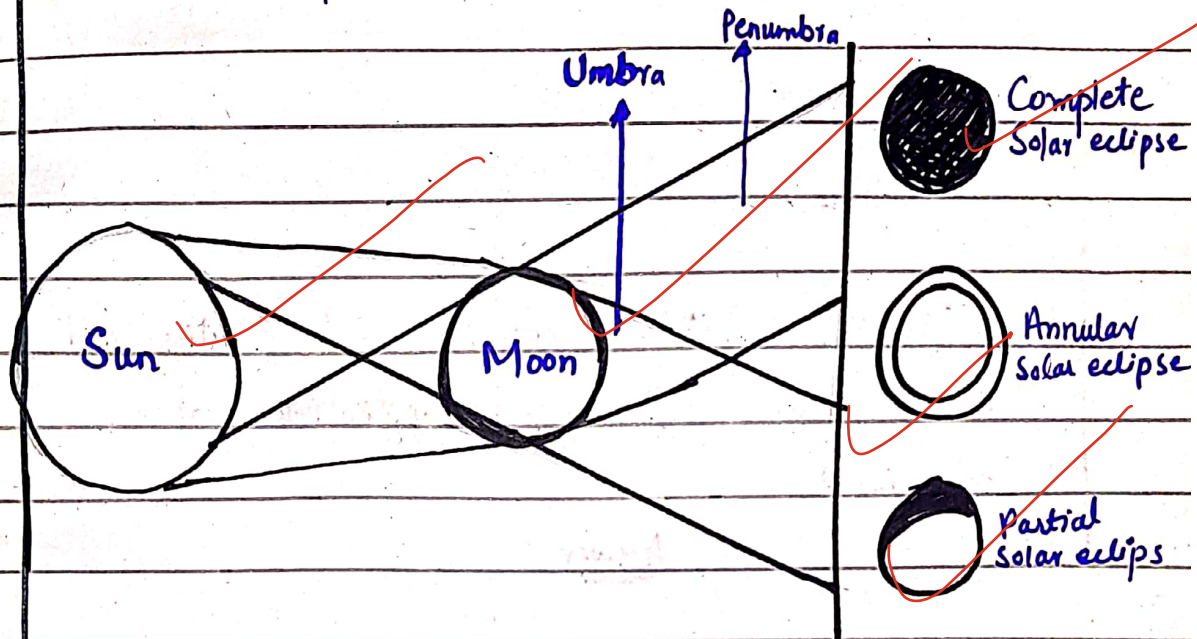
When moon comes between the Earth and the Sun and casts shadow across Earth's surface is called Solar eclipse. It occurs after every 18 months for 7 and a half minutes during new moon, and can cause loss of vision.

#### Lunar eclipse

When the Earth comes between the Sun and moon and casts a shadow on the moon is called lunar eclipse. It occurs twice a year for about 1 hour during full moon and has no dangerous impact.

## Types of solar eclipse

There are three types of solar eclipse, including complete, partial, and annular solar eclipse.



### 1) Complete Solar Eclipse

It occurs when moon aligns precisely between the Sun and the Earth and casts its shadow on the planet, blocking the sun completely at umbra and partially at penumbra.

### 2) Partial Solar Eclipse

It occurs when the moon partially covers the Sun, and only a partial shadow falls on the Earth.



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### 3, Annular Solar eclipse

It occurs when the moon does not cover the sun, instead creates a ring of fire effect due to the moon's greater distance from the Earth during its elliptical orbit.



by Differentiate between ceramics and plastics and discuss the types and applications of ceramics.

#### Answer

##### Ceramic

A ceramic is an inorganic non-metallic solid made up of clay that have been shaped and hardened by high temperature.

For example, cement, alumina, and porcelain.

##### Plastics

Plastics are materials that are made up of organic molecules with properties of being lightweight and flexible and melts on heating.

For example, PVC, nylon, and polyethylene.

## Types of ceramics

### Traditional Ceramics

- Traditional ceramics are clay-based materials, like bricks and tiles, used in building materials and sanitary ware.

### Bioceramic

- Bioceramics are materials of oxides and calcium used in artificial bones and joint replacements.

### Advanced ceramics

- Advanced ceramics are pure compounds like silica used in electronics and cutting tools.

## Applications of ceramics

i) Use in aerospace: Ceramics are used in the formation of rockets, space shuttles, and space stations.

ii) Use in medical: Ceramics are used in medical for dental and bone filling purposes.

iii) Use in construction: Ceramics are used by manufacturers to make bricks, tiles, and pipes.

iv) Use in automotive industry: Ceramics are widely used in catalytic converters, rotors, and spark plugs in automotive industry.



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v) Use in electronics. Many insulators, capacitors, and resistors are made up of ceramics.



c) Differentiate between food contamination and food adulteration. Name the food contaminants and food adulterants, at least five.

### Food contamination

Food contamination refers to the accidental and unintentional presence of harmful substances in food that spoils food quality.

### Food adulteration

Food adulteration refers to intentional addition of harmful substances to food for debasing its quality.

### ⇒ Names of five food contaminants

- 1) Pesticide residues from sprays on crops.
- 2) Heavy metals like mercury and lead.
- 3) Bacteria like E. coli and viruses and fungi.
- 4) Plasticizers leaching from containers.
- 5) Dioxins from industrial pollutants entering into food chain.

### ⇒ Names of five food adulterants

- 1) Adding water into milk to increase quantity
- 2) Starch powder in curd.
- 3) Red bricks powder into chili
- 4) Papaya seeds in pepper
- 5) Chalk powder in flour



d) What is imbalanced diet? What are the main consequences of un-balanced diet?

### → Imbalance diet

Imbalance diet refers to the diet in which there is no proper and appropriate amount of food components, like vitamins, proteins, carbohydrates, minerals, and lipids.

~ World Health Organization

### → Consequences of unbalanced diet

i) First, due to unbalanced diet a body can not produce sufficient amount of energy.

ii) Another consequence of unbalanced diet includes it retards the growth and development of human body.

iii) Moreover, owing to unbalanced diet, a body's defense system becomes weak, and it cannot fight germs properly.

iv) Due to unbalanced diet, a body can not balance weight as a result weight fluctuates.

v) Lastly, due to unbalanced diet, various systems of body can not function properly like digestive system.

### Question #3

a) What is chemical bonding? Give its types with examples.

#### → Chemical bonding

Chemical bonding refers to the strong electrical force of attraction that holds atoms, ions, or molecules together to form a compound.



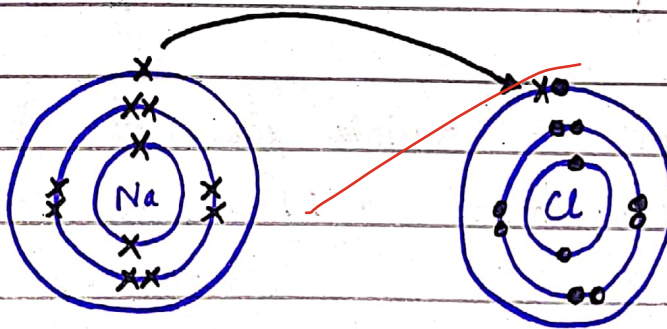
## Types of chemical bonding

There are three types of chemical bonds, including ionic, covalent, and metallic bonding.

### i) Ionic bonding

In this type of bonding, electrons are transferred from a metal to non-metal, as a result forming positive and negative ions.

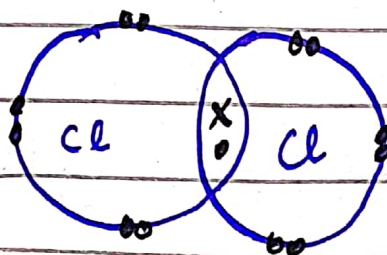
For example



### ii) Covalent bonding

In this type of bonding, two or more non-metal atoms share pairs of electrons in order to achieve full outer shell.

For example:

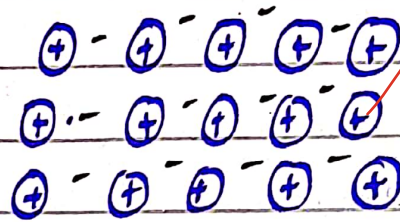




### iii) Metallic bonding

It involves a lattice of positive metal ions surrounded by a sea of delocalised electrons, helping in conduction of heat and electricity.

For example



b) What are the possible causes of floods in Pakistan? Propose reliable suggestion to cope.

#### ↳ Cause of floods in Pakistan

There are a multitude causes of floods in Pakistan. Some of them are discussed below.

i) First and foremost cause of floods in Pakistan is climate change which causes high temperature and glacier melting, resulting in floods in Pakistan.

ii) Another significant cause of floods in Pakistan is unpredictable and extreme monsoon weather, causing torrential rains.

iii) Moreover, lack of proper infrastructure for water storage is another major cause of floods in Pakistan.

iv) Furthermore, Glacial lakes Outburst and Cloud bursting are significantly leading to floods in Pakistan.

v) Lastly, geographical location of Pakistan is also cause of floods in Pakistan as Pakistan is lower riparian and ultimately receive all excessive water of upper riparians that is India and China, apprehensively causing floods in Pakistan.

↳ Reliable suggestion to cope with floods in Pakistan

i) First, the government must modernize the infrastructure of dams and barrages in order to increase their water storage capacity. In this

way flood water can be stored in dams.

ii) Additionally, the government should develop a modern AI-driven weather predication system which can be used in early warnings and preparedness.

iii) Moreover, to cope with floods, the government must create an effective and robust disaster management system.

iv) Next, the menace of climate change is important to be resolved with the help of climate justice funds in order to cope floods.

v) Last but not least, the government should implement all flood related policies in letter and true spirit to timely cope with the issue.





d, What is big bang theory? Give evidence to support the Big bang.

## Big bang theory

Big bang theory is related to the explanation about the origin of the universe. The theory states that at beginning, the entire universe was inside a bubble which was namely singularity. With passage of time that bubble exploded and the universe came into being with time, space, and matter. And it is still expanding.

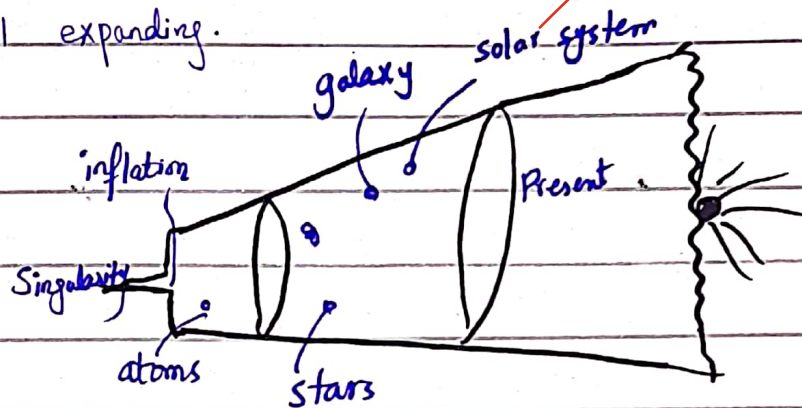


Figure illustrating the phenomena of Big Bang

## Evidence to support Big Bang

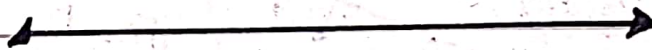
### → Spectrum of light

With the help of spectrum of light of star or galaxy, astronomers tell whether it is moving towards Earth or away from Earth. It states that if an object is moving

away from the Earth, its light shifts to longer wavelength called red shift. This red shift aligns with expansion of universe, as a result it supports big bang theory.

### ↳ Cosmic microwave background radiations

Arno Penzias and Wilson detected cosmic microwave background radiations during study of radio signals. These radiations are received from all parts of the universe and is thought to be the heat left over from original expansion or big bang of the universe.



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