

Qno 2

(a) What is dengue? Give a brief account of its causative agents and its symptoms.

Dengue:

Dengue is a viral infection transmitted to human through the bite of infected *Aedes* mosquitoes.

There are four types of this virus: DENV-1, DENV-2, DENV-3 and DENV-4

A brief account of its Causative agent and its Symptom:

Dengue is transmitted primarily by the *Aedes aegypti* mosquito and to a lesser

Aedes albopictus. These mosquitoes are most active during early morning and late afternoon.

Once infected with dengue, the mosquito can carry and transmit the virus for its

entire life. The caustic virus target replicate white blood cell.

Symptom of dengue:

Symptoms of dengue usually appears 4-10 days after an infected mosquito bite and range from mild to severe. Common symptom include:

- 1) High fever
- 2) Severe headache
- 3) Pain behind the eyes
- 4) Joint and Muscle pain
- 5) Vomiting
- 6) Skin rash etc.

What are the covalent bond?

Explain types along with elaborated structures.

Covalent bond:

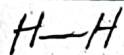
A bond formed by the mutual sharing of electron between two atom is known as covalent bond.

Types of covalent bond:

(1) Single Covalent Bond:

covalent bond is ^{formed by} sharing by of one electron pair between two atoms and represented by a single line.

Example



(2) Double Covalent Bond:

A double covalent bond involves sharing of two electron pairs is called double covalent bond and represented by two short electron

Example



(3) Triple Covalent bond:

In a triple bond, three pairs of electrons are shared between two atoms

and is represented by three parallel lines

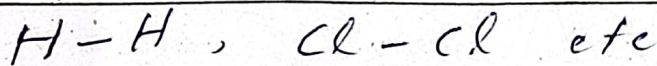


Special Types of Covalent bond:

(1) Non-covalent polar Bond:

In this type of covalent bond, like atoms in which the bonding electron is equally shared by atom is called non covalent bond.

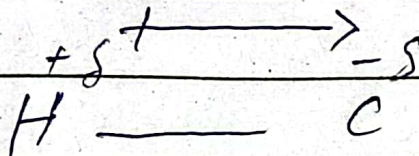
Example



Polar Covalent Bond:

The sharing of electron pairs between unlike atom in which the bonding electron pair is not equally shared is called a polar covalent bond.

Eg Example



What is lunar eclipse? Explain in detail with opt diagram.

Eclipse:

The eclipse means the obscuring of one astronomical object by another.

Lunar Eclipse formation:

When Earth comes between the sun and the moon & casts the shadows across the lunar eclipse. It is the common phenomenon and about three lunar eclipses occur yearly.

Types of lunar eclipse

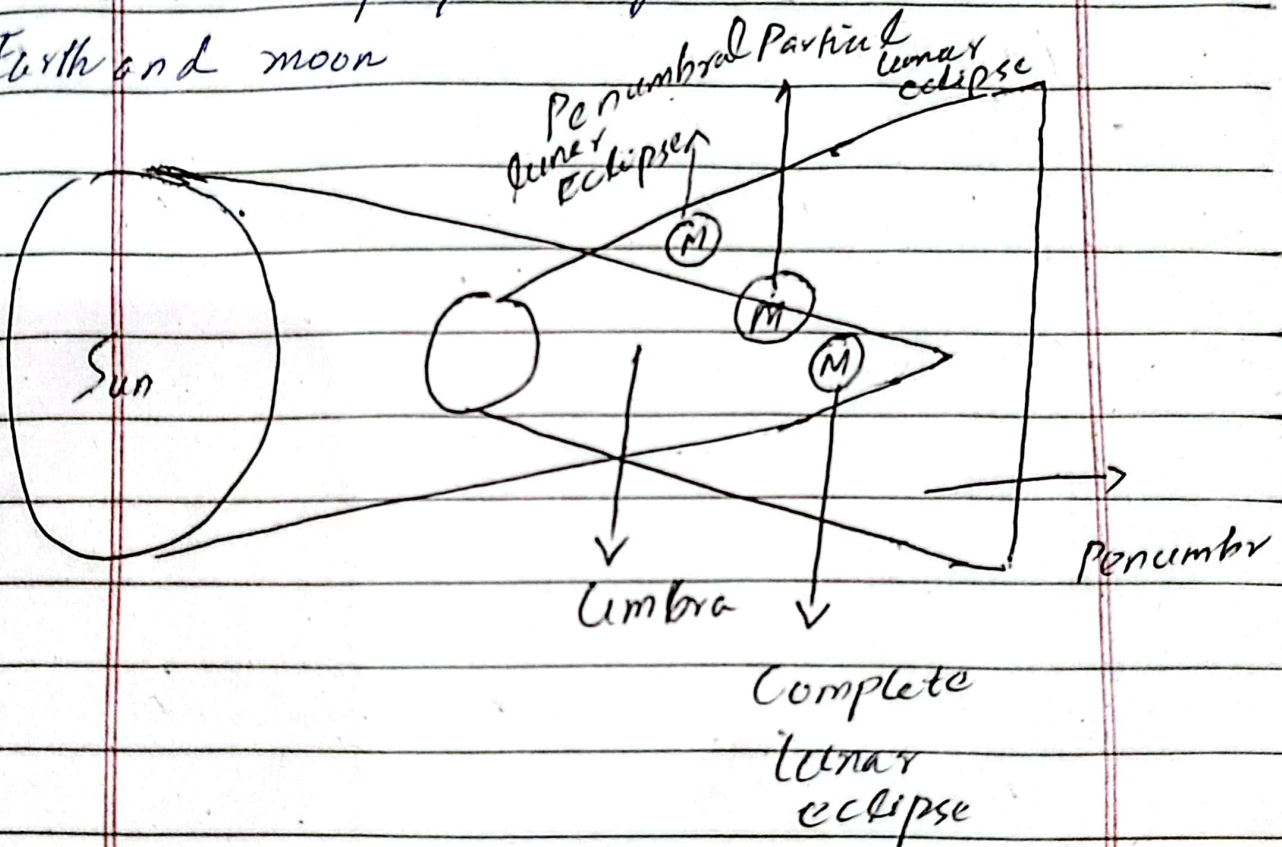
1- Complete lunar eclipse

When the entire moon comes under umbra part of the shadow, it is called a complete lunar eclipse. It happens when

it is a full moon and the sun, Earth and Moon are aligned in a straight line.

2- Partial lunar eclipse

(When the moon passes through the part of the Earth's Umbra, it is called a partial lunar eclipse. It occurs due to the imperfect alignment of the sun, Earth and moon)



3- Penumbral lunar eclipse:

When the moon travels through the Earth's penumbra, it is called penumbral lunar eclipse. It is also called occurs due to imperfect alignment of the sun, Earth and moon.

QNo 3

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(a) Explain function of enzymes in detail with examples:

Enzymes:

Enzymes are the most important group of proteins which are biologically active.

They are highly specific, each having responsible for a particular type of reaction. Since enzymes are responsible for catalyzing the reaction, without them, the reaction would proceed at a very slow speed, making life impossible.

Examples:

Pepsin

Sucrase

Lipase

Function of Enzymes:

Generally, the main function of enzyme is to speed up the reaction rate by attracting substance (reactants) with the active site of the enzyme to form a product;

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The general function of enzyme are as follows

- 1- Enzyme, such as protein kinase, are pivotal in facilitating signal transduction processes.
- 2- Enzymes assist in breaking down large molecule into smaller
- 3- ATP ^{enzymes} is instrumental in the synthesis of energy, contributing to body's energy production.
- 4- They maintain cellular balance.
- 5- They are responsible for biochemical reaction, such as oxidation and reduction,

Are earthquake and volcanic eruptions are interconnected. If yes then how?

Earth quake and volcanic eruptions are interconnected.

How they are Interconnected:

(1) Tectonic plate Movement;

Both ^{often} occurs in tectonic plate boundaries. When the plates move, they create crack and fracture in the earth's crust. This allows ~~to~~ magma to rise, potentially leading volcanic eruption and earthquake due to release of stress along fault lines.

(2) Pressure Buildup and Release:

When magma moves toward surface, it build pressure. This can cause small to large earthquake. These ~~can~~ earthquake known as volcanic eruption.

(3) Subduction Zones

Subduction zones

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are located where tectonic plates
meet each other, in case of
earthquake, the magma also
rise.

In conclusion, both share close
relationship with each other.

Qno 0 **Section 2**

(a) Determine the value "k" if the arithmetic mean of 9, 8, 10, k, 12 is 15.

Solution

Given

$$\frac{9 + 8 + 10 + k + 12}{5} = 15$$

Hence we get

$$\frac{39 + k}{5} = 15$$

Now simplify the above equation we get

$$39 + k = 15 \times 5$$

$$39 + k = 75$$

$$\boxed{k = 36} \quad \text{Answ.}$$

(c) What will be volume of football with radius of 12 cm

Sol - Volume of the football.

$$V = \frac{4}{3} r^3$$

$$\therefore r = 12$$

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$$= \frac{4}{3} \times (12)^3 \times 3.14$$

$$V = 7234.56 \text{ cm.}$$

$$-10 + 2^2 = -10 + 4 = 6$$

$$-8 + 2^3 = -8 + 8 = 0$$

$$6 + 2^4 = 6 + 16 = 22$$

$$40 + 2^5 = 40 + 32 = 72$$

$$102 + 2^6 = 102 + 64 = 166$$

166. Comes at place of
mark.