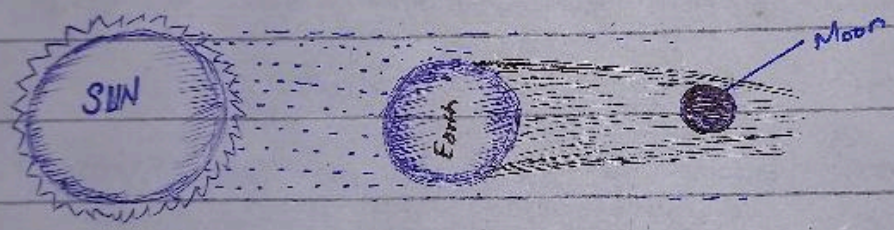
Sana Nasim
Batch # 371

QNO-3:

a. Lunar Eclipse:

Definition:

Lunar eclipse is the astronomical event caused when Earth comes between sun and moon blocking the solar light for moon and casting a shadow on it.



Explanation:

Moon revolves around Planet Earth which in turn revolves around (in orbit) around sun. A point comes when all of them are aligned in a straight line. If Earth comes in middle of moon and sun it causes a temporary blockage of light, causing moon to appear darker in broad day light.

b. Functions of Enzymes:

Enzymes are the biological catalysts which perform following functions:

i. Speed up reaction:

Enzymes speed up the reactions without being consumed in the process. So that they can be used again and again.

ii. Lowering activation energy of reaction:

Enzymes speed up reactions by lowering the activation energy of reactions.

iii. Break down of substrate particles (Digestion):

Enzymes play key role in catalysis, converting substrate molecules in products.

iv. DNA replication and transcription:

Enzymes are the key performs in DNA replication (copying of DNA strands) e.g. DNA polymerases, helicases etc, and in transcription (formation of RNA using DNA tempelates) e.g. RNA polymerase etc.

v. Regulatory functions:

Enzymes also perform regulatory functions within cells.

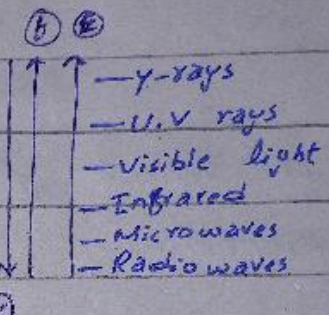
C. Electromagnetic Radiations:

• Defn: Electromagnetic radiations consist of electric and magnetic waves which require no medium for propagation i.e. can propagate through space, and carry momentum and energy.

e.g. Solar energy and light.

• Explanation:

Sun light not only consists of visible light but a variety of radiations.



When we divide these electromagnetic radiations in categories as per their frequency and speed, the series is obtained called EMR Spectrum. This process is done via the specialized instrument called spectrometer which shows bands of radiations with different energies, speeds and frequency. These radiations are:

i. Gama rays: Having highest energy and frequency and lowest wave lengths.

ii. U.V rays

iii. Visible light

iv. Infrared light

v. Microwaves:

vi. Radiowaves: having lowest energy and speed and highest wave length.

The wavelength, speed and energy of other radiations vary between γ-rays and radiowaves.

---

d. Interconnection of Earthquakes and Volcanic Eruptions:

Earthquakes can be caused by movement of Tectonic plates as well as by volcanic eruptions.

As volcanos are formed when magma inside earth founds a weak spot in earth-crust and causes eruption of molten lava which solidifies once outside of volcano. The movement of magma, during this process, inside earth along with gases cause movement of sorrounding earth crust (the magnitude can vary). So yes volcanic activity and sudden eruption can cause earthquakes as well. When a considerable quantity of lava (which is magma when under earth crust) comes out it will creat a vacuum behind it causing movement of sorrounding magma to its place and consequently the movement of area above that region.

Q NO 6: (a) value of 'k'

Solution:

As we know that; Mean = $\frac{\text{Sum of no.'s/quantities}}{\text{Total no. of quantities}}$

As:

Mean = 15

So Putting values in formula:

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

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

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

$$39+k = 75$$

$$k = 75 - 39$$

$$= 36$$

So value of k is 36.

(c) Volume of football:

As football is a sphere so its volume will be calculated through the formula

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

while

r = Radius = 12cm

Sol:

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

$$= \frac{3}{4}\pi \cdot (12)^3$$

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

$$= (0.75)(3.14)(1728)$$

$$= 4069\ cm^3$$

or

$$= 0.004069\ m^3$$

Q NO 4 ② Noise Pollution:

Unhealthy and undesirable levels of noise in envisoment are termed as noise pollution.

Harmful effects:

The healthy level of sounds is 45 db and below. Any sound above this level will be considered noise which cast harmful effects on human beig. Following are the effects:

i. It can cause psychological impacts e.g. disturbance in concentration, headaches etc.

ii. High levels of noise can cause auditory domages e.g. deafness etc.

iii. Noise pollution can also impact birds and animals in the somounding areas.

- Ways to controll and manage:

Noise pollution can be controlled and reduced via :

i. Plantation:

Plantation can act as a barrier and can help in reducing noise levels.

ii. Keeping in check horns & loudspeakers:

Unnecessary horns and loudspeakers should be controlled and should be used where needed.

iii. Noise management in heavey machinery and construction sites:

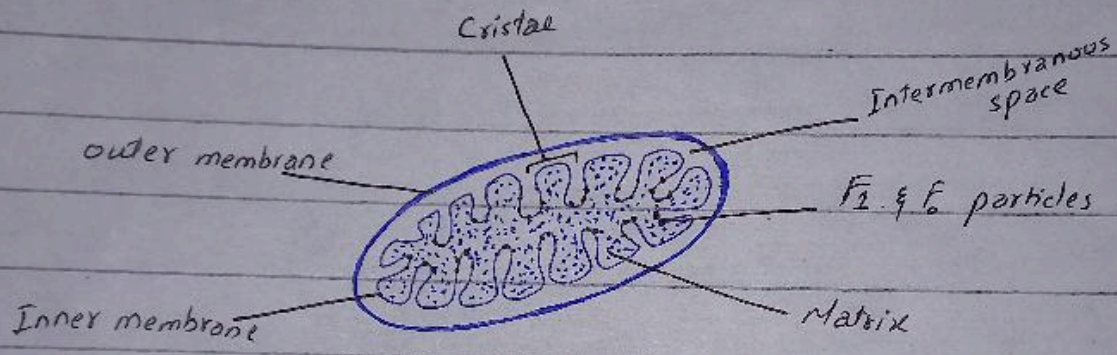
Steps should be taken to reduce noise on construction sites, also machinery parts should be properly functioning and should be designed in way to produce less noise.

Q No. 2:

© Structure & function of mitochondria:
(The Powerhouse)

Mitochondria is called powerhouse of cell because it generate energy in form of ATP molecules for cell. ATP is the energy currency of cell.

Structure:



Mitochondria is a double memberanous structure. Inner memberane is folded like finger projections called cristae. Critae contain F_1 and F_o particles attached on them which are actually ATP Synthetase enzymes. Inside of the inner membrane is matrix which contain important nutrients and material including enzymes and a circular DNA. Mitochondria is a self replicating organelle. Most abundently found in cells which are most active e.g. muscle cells ∴ They generate ATP via ETC reactions.

ⓓ Covalent bonds:

Covalent bond is a type of chemical bond formed by the mutual sharing of electrons between two atoms or more than two atoms.

e.g. H_2O , O_2 etc.

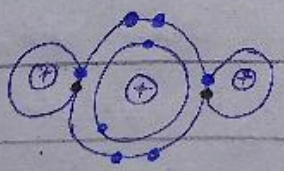
• Types of Covalent bonds:

Depending upon the number of electrons shared between two atoms covalent bonds can be divided into

i. Single covalent bond:

When only one electron is shared between two atoms of each type e.g. H_2O

or



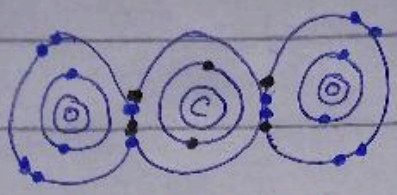
ii. Double Covalent bond:

When two electrons are being shared between atoms of each type.

e.g. CO_2

$:O=C=O:$

or



Both atoms share two electrons. 'C' carbon has shared two electrons with One 'O' atom and its two electron with other one.

iii. Tripple covalent bond:

When atoms share three electrons.

e.g. N_2.