

Section-I

Q No 3:-

a. What is Lunar Eclipse?

• **Definition:-**

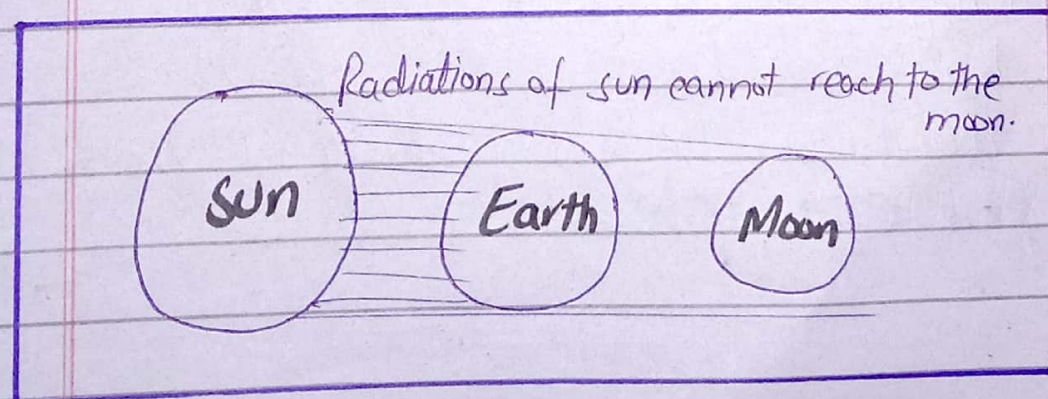
"When the earth lie between sun and moon, then the sun rays do not reach to the moon, This phenomenon is called Lunar Eclipse."

• **Types:-**

There are two types of Lunar Eclipse.

- i) Partial Lunar Eclipse
- ii) Full Lunar Eclipse

Diagram:-



• Explanation:-

When The earth rotates around its own axis and revolve around the sun.

In Lunar Eclipse, the earth place between the sun and the moon.

Sometimes, the whole surface of moon is covered by the Earth and sometime half surface is covered. So, the radiations of sun is not reach the moon.

b. Functions of Enzymes:-

• Definition:-

"Enzymes is the protein, which help in metabolism, digestive system of the body."

• Functions:-

- 1) Enzymes act as a catalyst in the body and boost up the chemical reaction in the body during metabolism.
- For example:-**

- Lipids break down into fatty acids with the help of **Lipase**.
- Proteins break down into amino acids with the help of **Proteinase**.

2) Enzymes play a crucial role in the process of digestion.

For example:-

When food is present in the mouth **Amylase** enzyme convert it into starch.

When chyme is present in duodenum different enzymes act on it and convert it into amino acids, fatty acids and glucose.

3) Enzymes play a important in the regulation of temperature in the body.

4) Enzymes also contribute in the formation of blood in bone marrow.

5) It is also maintain pH **(7.35-7.4)** in the body.

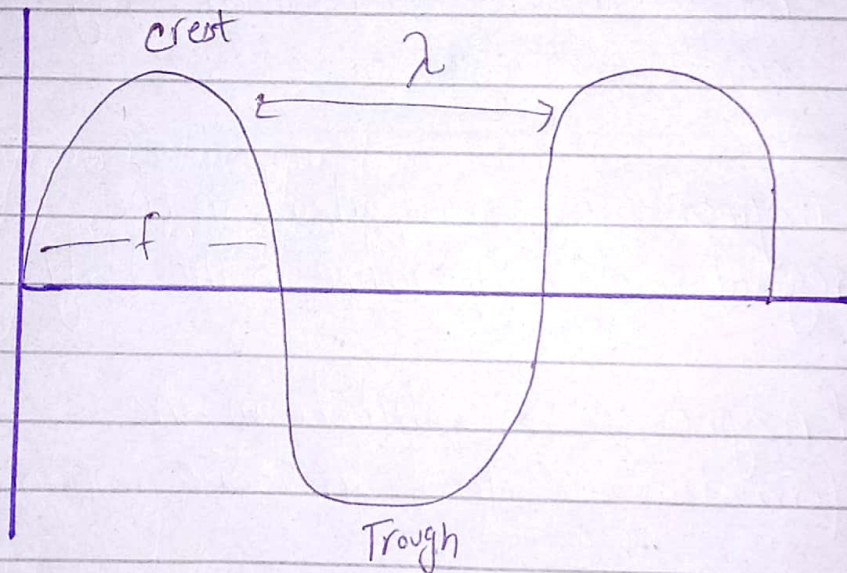
c. Electromagnetic Radiation: -

"Electromagnetic Radiation is the type of wave which do not need any medium."

- It is the transverse wave.
- The speed of EM radiations is equal to speed of light ($3 \times 10^8 \text{ ms}^{-1}$)
- It can not deflect in the electric field and magnetic field

$$v = f \lambda$$

Diagram:-



Electromagnetic Radiation Spectrum.

The electromagnetic spectrum consists of radio waves, microwaves, infrared waves, visible, UV rays, X-rays and gamma rays.

i) Radio waves:-

- Radio waves have high wavelength (1mm) and low energy and frequency.
- Radio waves are used in different applications such as Radar system, satellites.

ii) Microwaves:-

- Microwaves have high wavelength (less than 1mm) but less than Radio waves.
- It has low energy and frequency.
- Microwaves are used in microphones. It helps in communication.

iii) Infrared Radiations:-

- Infrared radiations have high wavelength (more than 700nm) but low energy and frequency.
- Infrared radiations are used for diagnostic purposes e.g tumor finding.

iv) Visible Light:-

- Visible light have high range of wavelengths 400 to 700 nm. It consists of seven colors.
- Visible light, we can see in naked eyes.

v) UV-Rays:-

- Ultraviolet radiations have 320nm wavelength.
- UV radiations are dangerous for human skin and cells.
- UV radiations are used for sterilization.

vi) X-rays:-

- X-rays have high energy and frequency but its wavelength is low.
- X-rays are used for the imaging of internal body e.g bones, organs etc.
- It is also used in diagnostic purposes e.g CT-Scan.

vii) Gamma Rays:-

Gamma Rays have high energy and it also used in diagnostic purposes e.g Nuclear Medicine.

d. Are earthquakes and volcanic eruptions interconnected? if yes, then how?

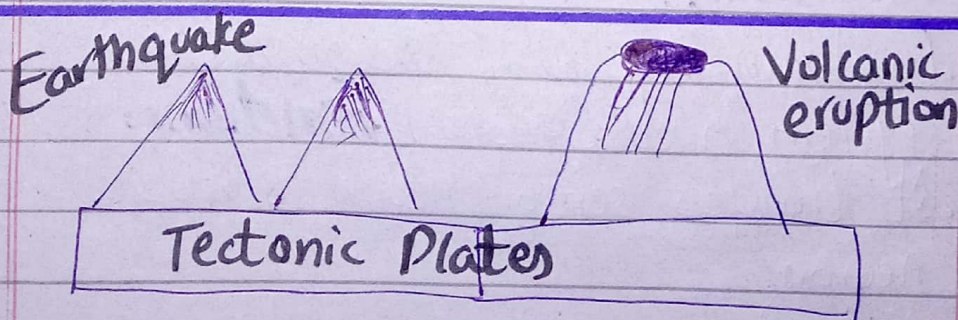
Yes, earthquakes and volcanic eruptions are interconnected because the causes of earthquake and volcanic eruptions are similar.

Earthquake occurs in the release of seismic waves that create vibrations in the earth crust due to the movement of tectonic plates.

Volcanic Eruptions is a opening or vent of hot magma. It occurs due to the movement in tectonic plates.

So, both earthquake and volcanic eruption occurs in the movement of tectonic plates in the earth. That's why, they are interconnected.

Diagram:-



Q#5

a. Give structure and functions of human brain. Why is it the control center?

• Definition:-

- "Brain is the control center of human body. It controls all the functions which take place in the body."
- It contains nerve impulses which receive the signals and transfer it throughout the body for different functions.

Structure of Brain:-

There are three parts of brain.

- Fore brain (largest part of brain)
- Mid brain
- Hind brain

1) Forebrain:-

Forebrain consists of Thalamus, Limbic system and Cerebrum. **Functions:**

- It transfers sensory neuron to motor neuron.

- It carry information from optic nerve and auditory nerve.
- It controls sleep-wake cycle, menstrual cycle, emotions and memory.
- It stimulates hormones which perform different functions in the body.

2) Midbrain:-

Midbrain is the bridge between forebrain and hindbrain. **Functions:**

- It transfer information from forebrain to hind brain.
- It stores short term memory.

3) Hindbrain:-

Hindbrain consists of medulla oblongata, pons and cerebellum.

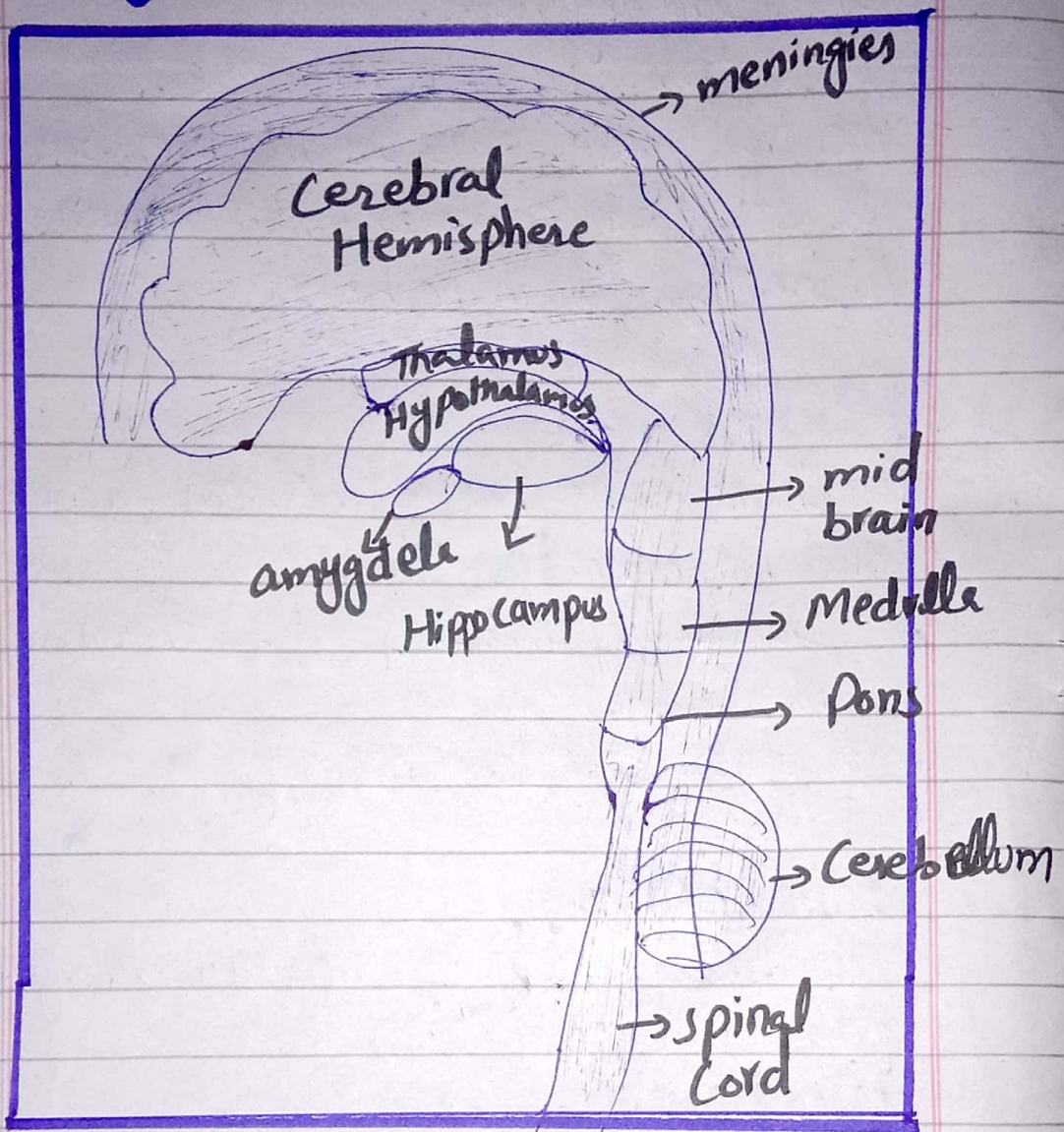
Functions:-

- It transfer information from brain to spinal cord.
- It stores long term memory.

Brainstem:-

It consists of medulla, pons and spinal cord.

Diagram: -



• Why is it the control centre?

Brain consists of millions of neurons that carry information throughout the body. When brain generate impulse then body organs start their specific work. That is

Why, brain is called control centre
of body.

c. Write a short note on
elaborating fat soluble vitamins?

• **Definition:-**

"Fat soluble vitamins are those vitamins
which dissolve in fat."

• Fat soluble vitamins are:

- 1) Vitamin K
- 2) Vitamin D
- 3) Vitamin A
- 4) Vitamin E

1) **Vitamin K:-**

• **Source:**

Meat, Chicken, Egg, vegetables and
grains.

• **Use:-**

- Vitamin K use as a nutrient.
- The daily requirement is 15µm.

Function:-

- It helps in clotting, coagulation and platelets collection.

2) Vitamin D:-

Sources:-

- Sunlight, milk, beef and vegetables, fruits.

Function:-

- It develop bones and helpful in the growth of bones.

3) Vitamin A:-

Sources:-

- Vegetables, grains, fruits, egg, milk, meat, fish.

Function:-

- It help in skin, regulate temperature. It also helpful in the function of eye.

Vitamin E:-

Sources:-

- Dry fruits, fruits, milk, walnut, grains, vegetables (especially green vegetables).

Functions:-

- It help in the growth of hair, nails.
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Section-II

Q#6:-

Determine "k" if the Arithmetic Mean

a. 9, 8, 10, k, 12 is 15

Answer:-

$$\text{Arithmetic mean} = \frac{\sum x}{n}$$

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

$$\left[\text{If } \boxed{k=36}, \text{ then arithmetic mean is:} \right]$$

$$= \frac{9+8+10+36+12}{5}$$

$$= \frac{75}{5}$$

$$\boxed{\text{A.M} = 15}$$

9, 8, 10, **36**, 12

b. Let

sugar solution is = $4x$

Colored water = $3x$

Then 10 liters of colored water is added

the sugar solution remains $4x$ and colored water is $3x+10$

So the Ratio is

$$\frac{4x}{3x+10} = \frac{4}{5}$$

$$20x = 4(3x+10)$$

$$20x - 12x = 12x + 40$$

$$8x = \frac{40}{1}$$

$$x = \frac{40^5}{80}$$

$$x = 5$$

So put the value of x in $4x$

$$\text{Sugar solution} = 4x$$

$$= 4(5)$$

$$\boxed{\text{Sugar solution} = 20 \text{ litres}}$$

c. Volume of football = ?
Radius = 12 cm

Formula:-

$$\left[V = \frac{4}{3} \pi r^3 \right]$$

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

$$V = 1.33 (3.14) (1728) \text{ cm}^3$$

$$V = 7216 \text{ cm}^3$$

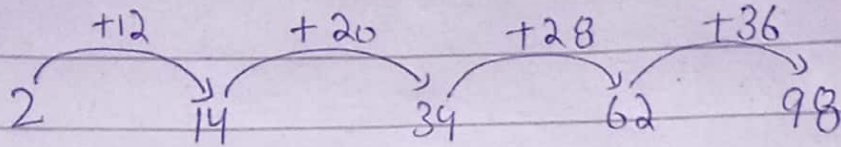
d. Series -10, -8, 6, 40, 102, ?

First Number = -10 to -8 = +2

Second = -8 to 6 = +14

Third = 6 to 40 = +34

Fourth = 40 to 102 = +62
Fifth = 102 to 200 = +98



$[-10, -8, 6, 40, 102, 200]$

Q#7 :-

a If 20% of $x = y$, what is the value of $y\%$ of 20 in terms of x ?

$$20\% \text{ of } x = y$$

$$\frac{20x}{100} = y$$

$$\frac{1}{5} = y$$

$$y\% \text{ of } 20 = x$$

$$\left(\frac{1}{5}\right)\left(\frac{1}{100}\right)20 = x$$

$$\frac{1}{5} \times \frac{1}{5} = x$$

$$\frac{1}{25} = x$$

b. P and Q salary = Rs 5050

Q and R salary = Rs 6250

P and R salary = Rs 5200

Find monthly salary of P = ?

$$P + Q = (5050 \times 2) = 10100 \text{ --- (1)}$$

$$Q + R = (6250 \times 2) = 12500 \text{ --- (2)}$$

$$P + R = (5200 \times 2) = 10400 \text{ --- (3)}$$

Add all the equation

$$2(P + Q + R) = 33000$$

$$P + Q + R = \frac{33000}{2} = 16500$$

$$P + (Q + R) = 16500$$

Put the value Q + R in eq (2)

$$P + 12500 = 16500$$

$$P = 16500 - 12500$$

$$P = 4000 \text{ Ans.}$$

c. Two coins are tossed 500 times and we get

Two heads: 105 times

One head: 275 times

No head: 120 times

Find the probability of each event to occur.

$$\text{Two heads} = \frac{105}{500}$$

$$= 21\%$$

$$\text{One head} = \frac{275}{500}$$

$$= 55\%$$

$$\text{No head} = \frac{120}{500}$$

$$= 24\%$$

d.

Jamie's dad is 4 times older than Jamie

$$\text{Jamie age} = x$$

$$\text{Jamie's dad age} = 4x$$

In 14 years time, Jamie's dad
will be twice the age of Jamie

$$\text{Jamie age} = x + 14$$

$$\text{Jamie's dad} = 4x + 14$$

Jamie's dad twice the age of Jamie, So

$$(4x + 14) = 2(x + 14)$$

$$4x + 14 = 2x + 28$$

$$4x - 2x = 28 - 14$$

$$2x = 14$$

$$x = \frac{14}{2}$$

\rightarrow

$$\boxed{x = 7}$$

$$\text{Jamie age} = 7$$

$$\text{Jamie's dad age} = 4x$$

$$= 4(7)$$

$$\boxed{= 28}$$

Jamie's dad age is 28 years
Jamie age is 7 years
