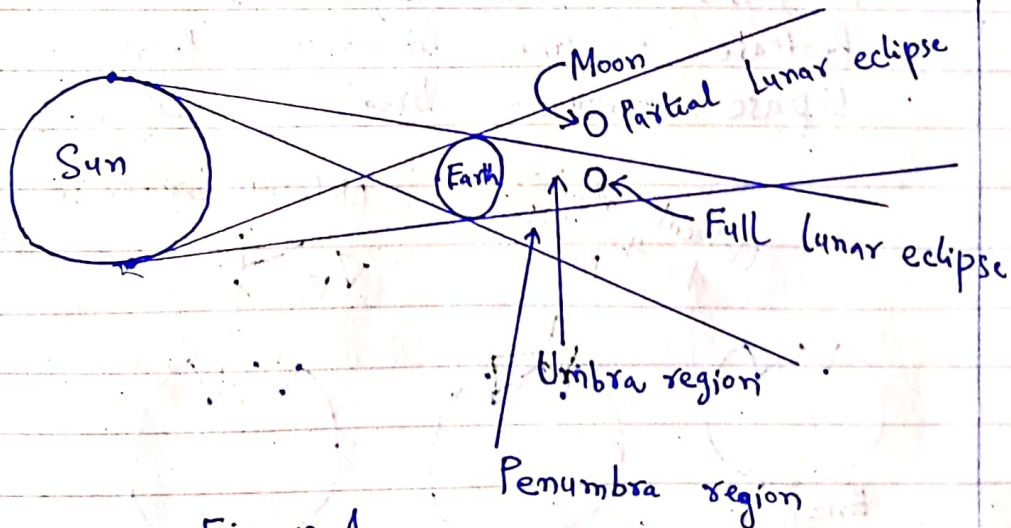


Question No: 3Part (A)Lunar Eclipse

"Lunar eclipse is an event that occurs when the Earth moves in between the Sun and the Moon, casting its shadow on the Moon."

When the Lunar eclipse occurs, the color of the Moon changes to red or dark gray. It can be full or partial lunar eclipse as shown in the Figure 1.

Figure 1

Part (B)

Enzymes

"Enzymes are the organic catalysts that help to speed up the chemical reactions in the living organisms."

⇒ Enzymes are made up of proteins. They help to speed up metabolic and anabolic reactions.

⇒ They are also helpful for the digestion of different nutrients, including Carbohydrates, Proteins, and Lipids.

For example:

Amylase enzymes digest Carbohydrates
Protease enzymes break up Proteins
Lipase enzymes break up Lipids.

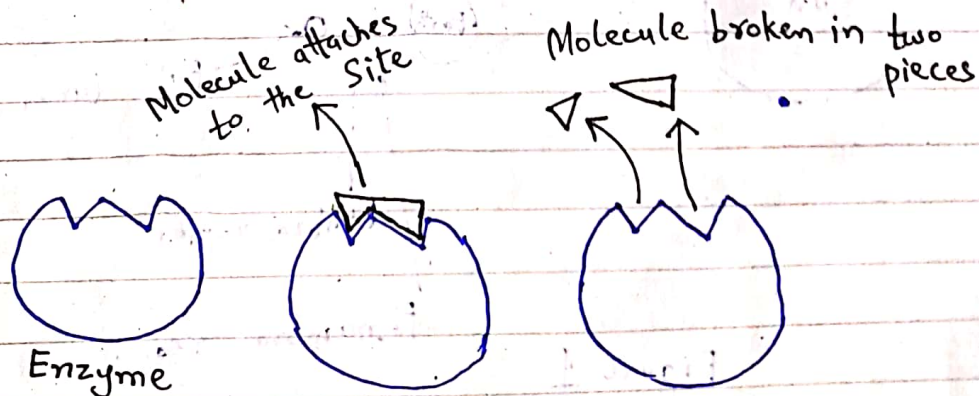


Figure 2

⇒ Enzymes do not utilize in the process and can break-up further molecules

Part (c)

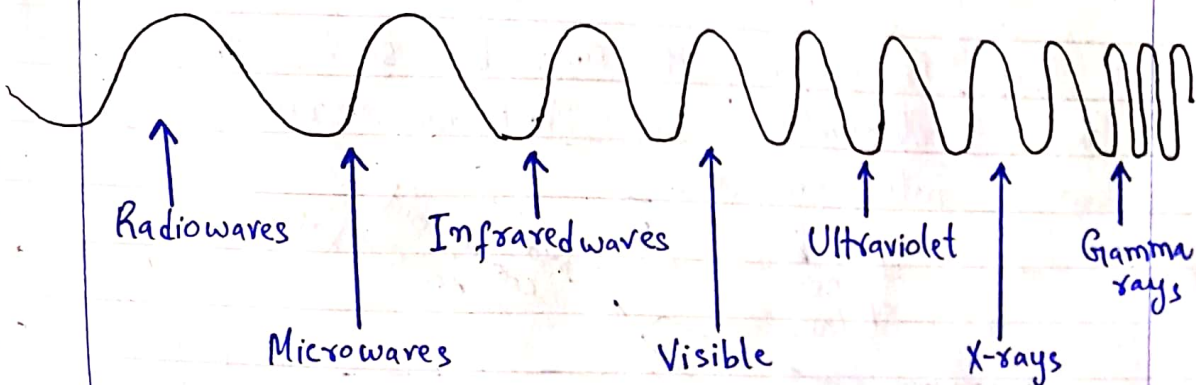
Electromagnetic radiations

“The radiations that can carry energy and travel in space are called electromagnetic radiations.”

- They do not require medium for propagation
- They have oscillating electric and magnetic fields perpendicular to one another

EMR Spectrum:- The electromagnetic radiation spectrum is the series of different electromagnetic radiations which are arranged according to wavelength as shown in Figure 3.

Figure 3



Radiowaves: Largest wavelength and smallest energy

Gamma rays: Smallest wavelength and largest energy

Part (D)

Yes, Earthquakes and Volcanic eruptions are interconnected to some extent.

⇒ Earthquakes occur when the tectonic plates of the Earth's crust collide and move with respect to one another. The energy is released when the built-up friction between them is ended.

⇒ Volcanic eruptions are the release of lava and fumes from the gaps of the Earth crust.

⇒ These gaps are present where the tectonic plates meet each other.

⇒ They are produced due to the Earthquakes, which breaks the crust.

⇒ That is why, it can be said that the Earthquakes and Volcanic eruptions are interconnected.

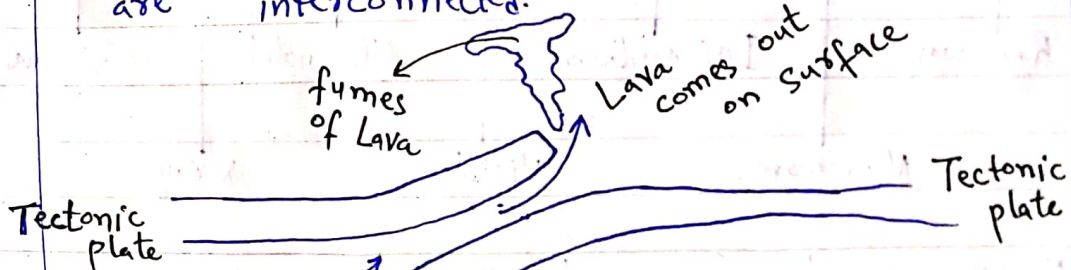


Figure 4

Magma is forced outward due to intrusion of tectonic plate

Question No: 4

Part (a) Noise pollution

“The presence of high intensity of sound waves (particularly above 80 decibels) that is unpleasant to hear and harmful to the health.”

Harmful effects:

- ⇒ Noise pollution of high intensity and persistent can cause permanent hearing loss.
- ⇒ It can also cause stress and anxiety.
- ⇒ It can also disturb sleep at night-time, causing severe health complication.
- ⇒ It is especially harmful for infants and the elderly people.

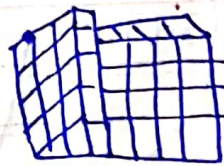
Sources of Noise Pollution.



Factories



Vehicles



Construction sites



Loudspeakers

Figure 5

Part (B) Importance of Fibres

'Fibres are the polysaccharide carbohydrates that cannot be digested by human body.'

Fibres are important because:

⇒ They prevent constipation by ensuring smooth excretion of waste from intestines

⇒ Fibres are the food for good bacteria present in our large intestine.

⇒ Fibres help in digestion process by acting as bulk formation.

(ii) Platter of food will be considered as balance if it contains sufficient amounts of all the macro- and micro-nutrients that are needed by the human body to function properly.

Include foods like:

• Meat
• Fish
• Vegetables
• Fruits
• Grains

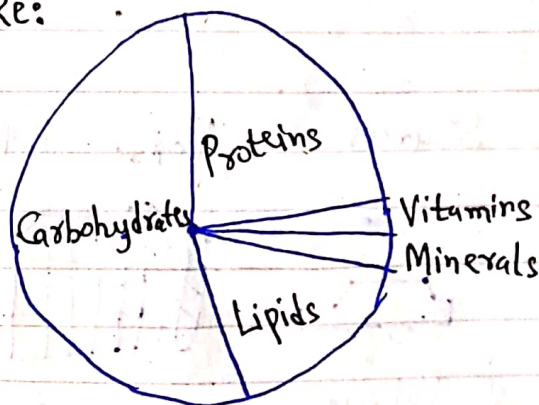


Figure 6

Part (c)

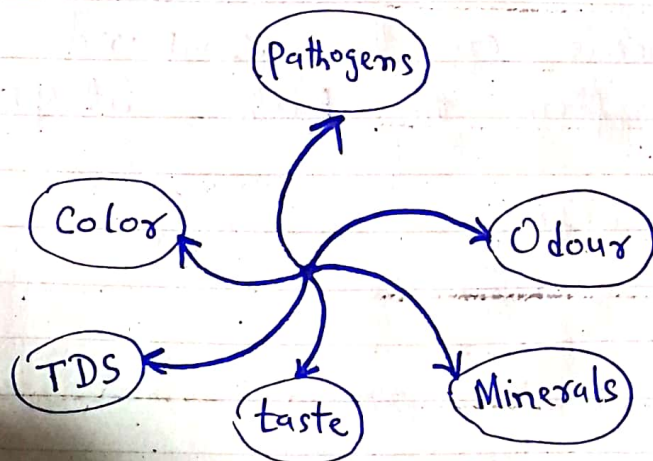
“Drinking water standards are the limits of chemicals and nutrients set by various organizations under which water can be safely used for the drinking purpose.”

⇒ The standards of drinking water set by World Health Organization (WHO) are used in many countries.

⇒ Some standards are:

- There should be zero pathogens.
- The Total dissolved Solids (TDS) should be less than 1000 mg/L
- No odour
- No color
- No taste

Drinking water quality parameters:



Part (D) Lithosphere

"Lithosphere is the upper layer of the Earth and consists of Crust and Upper Mantle."

Lithosphere is the soil part of the Environment.

Litho = Soil

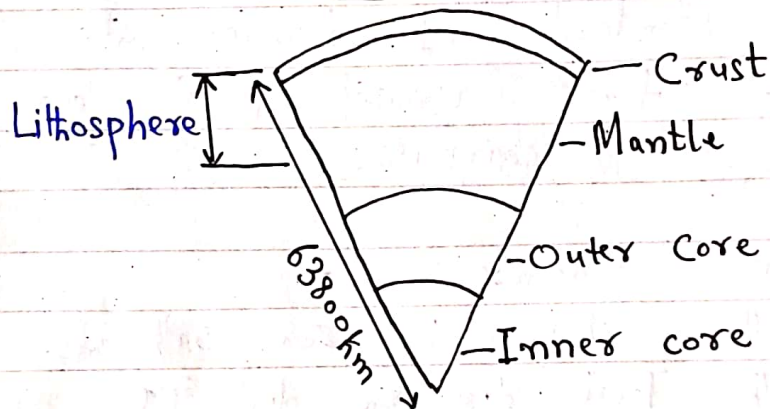


Figure 7

Rocks: Rocks are the solid materials made up of minerals and present in the Earth's Lithosphere.
eg: Basalt, Marble.

Minerals: Minerals are the compounds that form the Earth's Lithosphere.

eg: Copper, Iron

SECTION : 2

Question No: 6

Part (A)

Data:

Arithmetic mean = 15

value of $k = ?$

Given entities : 9, 8, 10, k , 12

Formula:

$$A.M = \frac{\text{Sum of entities}}{\text{No. of entities}}$$

put values:

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

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

$$k = 75 - 39$$

$$\underline{k = 36}$$

Result: The value of k is 36.

Part (B)

Data:

initial ratio of sugar solution to colored water = 4:3
colored water added = 10 litres

final ratio = 4:5

Initial quantity of sugar solution = ?

Solution

Let Sugar solution quantity be "S"

Let colored water quantity be "W"

Given: $S:W = 4:3$
 $\frac{S}{W} = \frac{4}{3}$

$$3S = 4W$$

$$W = \frac{3}{4}S \quad \text{--- ①}$$

Given: $\frac{S}{W+10} = \frac{4}{5}$

$$5S = 4W + 40$$

put value of W from eq ①

$$5S = 4 \times \frac{3}{4}S + 40$$

$$5S = 3S + 40$$

$$2S = 40$$

$$S = 20$$

Result: Initial quantity of sugar solution was 20 litres

part (c)

Data

football radius = 12 cm

Volume of football = ?

Solution

Formula:

$$\text{Volume of Sphere} = \frac{4}{3} \pi r^3$$

put values

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

$$V = \frac{4}{3} \times 3.14 \times 1728$$

$$V = 7142 \text{ cm}^3$$

Result: The volume of football is 7142 cm³.

Part (D)

Data

Series: $-10, -8, 6, 40, 102, ?$

Solution:

$-10, -8, 6, 40, 102, ?$

$$\begin{array}{cccc} & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\ +2 & +14 & +34 & +62 & \\ \Downarrow & \Downarrow & \Downarrow & \Downarrow & \\ 4-2 & 16-2 & 36-2 & 64-2 & \\ \Downarrow & \Downarrow & \Downarrow & \Downarrow & \\ 2^2-2 & 4^2-2 & 6^2-2 & 8^2-2 & \end{array}$$

For next number, add $10^2-2=98$
in the last number

$$\begin{aligned} &= 102 + 98 \\ &= 200 \end{aligned}$$

Result: The next number is 200.

Question No: 7

Part (A)

Data:

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

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

Given:

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

$$y = \frac{20x}{100} = 0.2x \quad \text{--- (1)}$$

Given:

$$\frac{y}{100} \times 20$$

put value of 'y' from eq (1)

$$\Rightarrow \frac{0.2x}{100} \times 20$$

$$\Rightarrow 0.04x$$

Result: y% of 20 in terms of x is 0.04x

Part (B)

Data:

Avg: P and Q salary = Rs. 5050

Avg: Q and R salary = Rs. 6250

Avg: P and R salary = Rs. 5200

Salary of P = ?

Solution:

Given:

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

$$\frac{Q+R}{2} = 6250 \Rightarrow Q+R = 12500 \quad \text{--- (2)}$$

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

subtract eq (2) from eq (1)

$$\begin{array}{r} P + \cancel{Q} = 10100 \\ \pm \cancel{Q} \pm R = \pm 12500 \\ \hline \end{array}$$

$$P - R = -2400 \quad \text{--- (4)}$$

add eq (3) and eq (4)

$$\begin{array}{r} P + \cancel{R} = 10400 \\ P - \cancel{R} = -2400 \\ \hline \end{array}$$

$$P = 8000$$

Result: The salary of P is Rs. 8000

Part (c)

Date:

Coins tossed $= n(S) = 500$

Two heads = 105 times

One head = 275 times

No head = 120 times

Probability of each = ?

i) For two heads

$$P(n) = \frac{105}{500} = \frac{21}{100}$$

ii) For one head

$$P(n) = \frac{275}{500} = \frac{11}{20}$$

iii) For no head

$$P(n) = \frac{120}{500} = \frac{6}{25}$$

Part (D)

	Now	After 14 years
Jamie	x	$x+14$
Dad	$4x$	$4x+14$

Given condition: Dad will be twice after 14 years.

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

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

$$2x = 14$$

$$x = 7$$

$$\text{Jamie's age now} = 7$$

$$\text{Dad's age now} = 4 \times 7 = 28$$

$$\text{Sum} = 28 + 7 = 35$$

Result: Sum of Jamie's and Dad's ages now is 35.