

(Section - II)Question no: 6

(a)

Arithmetic Mean = 15

Value of 'k' = ?

Given = 9, 8, 10, k, 12

Solution:

Arithmetic Mean = A.M = 15

A.M of 9, 8, 10, k, 12 = 15

k = ?

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

$$27+12+k = 15(5)$$

$$39+k = 75$$

$$k = 75 - 39$$

$$k = 36$$

So, The value of 'k' is 36.

(b)

Ratio of sugar solution and colored

water = $S_1 : W_1 = 4 : 3$

After adding 10 litre of coloured

water ratio becomes = $S_2 : W_2 = 4 : 5$

Quantity of sugar = ?

Solution:

Suppose the quantities of sugar and colored water are $4x$ and $3x$.

$$= 4x : 3x \rightarrow \text{eq. (1)}$$

After adding 10 litre of water the eq. (1) becomes:

$$4x : (3x + 10) \rightarrow \text{eq. (2)}$$

According to the statement eq. (2) will be equal to $4:5$.

So,

$$4x : (3x + 10) = 4:5$$

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

$$4x(5) = 4(3x + 10)$$

$$20x = 12x + 40$$

$$20x - 12x = 40$$

$$8x = 40$$

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

$$x = 5$$

So, the value of sugar in the mixture is $(x) = 5$

(c)

Volume of football = $V = ?$ radius = $r = 12 \text{ cm}$ Solution:

As we know,

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

where ' $\pi = 22/7$ '.

By applying formula:

$$\text{volume of football} = V = \frac{4}{3} \pi r^3 \rightarrow \text{eq (1)}$$

as $r = 12 \text{ cm}$.by putting value of ' r ' in eq (1).

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

$$V = \frac{4}{3} \left(\frac{22}{7}\right) (12)^3$$

$$= \frac{88}{21} (1728)$$

$$= \frac{152,064}{21}$$

$$V = 7241.1428 \dots \text{ cm}^3$$

we can also rewrite it as ' $2304 \pi \text{ cm}^3$ 'So the volume = $2304 \pi \text{ cm}^3 = 7241.1428 \text{ cm}^3$.

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(d)

Given series: $-10, -8, 6, 40, 102, ?$

Solution:

In the given series the sequence appears to increase based on a certain pattern.

$$-10 \text{ to } -8 \rightarrow +2.$$

$$-8 \text{ to } 6 \rightarrow +14$$

$$6 \text{ to } 40 \rightarrow +34$$

$$40 \text{ to } 102 \rightarrow +62.$$

By looking at the differences we have;

$$2, 14, 34, 62.$$

Now, after finding the difference between these differences we have,

'12, 20, 28, 36' which is increasing by a specific number '+8'.

∴ So the next term after 102 would be '200'.

$$-10, -8, 6, 40, 102, 200.$$

Question no: 8

(a)

Given formula \Rightarrow Charge = $\pounds 20 + 4n$.if $n = 7$, where 'n' is the number of windows.

How much he will charge = ?

Solution:

$$\text{charge} = \pounds 20 + 4n.$$

$$n = 7.$$

Simply putting the value of 'n' in the formula. we will have:

$$\begin{aligned} \text{charge} &= \pounds 20 + 4(7) \\ &= \pounds 20 + 28. \end{aligned}$$

$$\text{Charge} = \pounds 48$$

The charge would be equal to $\pounds 48$, which means Brain charges $\pounds 48$ to his customers.

(b)

Find the correct form of words:

(i) ralciep

(ii) tyhniarum

(iii) arsehcc

(iv) moniteah

(v) tareph.

Solution:(i) ralciep
replica.(ii) tyhniaum.
humanity.(iii) arsehcc
cashces.(iv) moniteah:
hemation(v) tareph
teraph

(c)

$$A = \{10, 11, 12, 13, 15\}$$

$$B = \{10, 12, 14\}$$

$$U = \{10, 11, 12, 13, 14, 15, 16, 18\}$$

Verify;

$$(A \cup B)' = A' \cap B'$$

Solution:

Suppose that $(A \cup B)'$ is left hand side,
and $A' \cap B'$ is right hand side.

L.H.S
 $(A \cup B)'$

R.H.S
 $A' \cap B'$

we have,

$$U = \{10, 11, 12, 13, 14, 15, 16, 18\}, \quad A = \{10, 11, 12, 13, 15\},$$

$$B = \{10, 12, 14\}.$$

$$A \cup B = \{10, 11, 12, 13, 14, 15\} \quad | \quad A' = U - A = \{14, 16, 18\}$$

$$(A \cup B)' = U - (A \cup B)$$

$$= \{16, 18\}$$

$$B' = U - B = \{11, 13, 15, 16, 18\}$$

$$A' \cap B' = \{16, 18\}$$

$$(A \cup B)' = \{16, 18\}$$

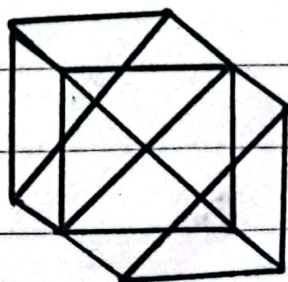
$$(A \cup B)' = \{16, 18\}$$

$$A' \cap B' = \{16, 18\}$$

Hence, proved that $(A \cup B)' = A' \cap B'$.
 as both sides are equal.

(d)

Find The number of triangles in the given figure.



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There are '24' number of triangles in the given figure.

PART - II

(Section - I)

Question no : 3

(a)

Lunar Eclipse:

When Earth comes between the Sun and the Moon, it is known as lunar eclipse.

There are two types of lunar eclipse:

- (i) Partial lunar eclipse.
- (ii) Total lunar eclipse.

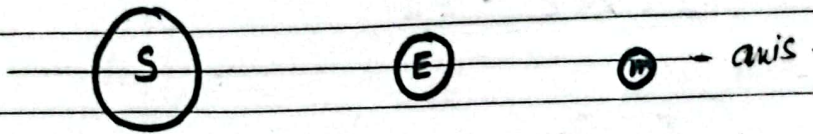
(S) (E) (M) (lunar eclipse).

In this situation the light of Sun could not reach the surface of moon, so it does not visible from Earth and appears darker.

(i) Total lunar eclipse:

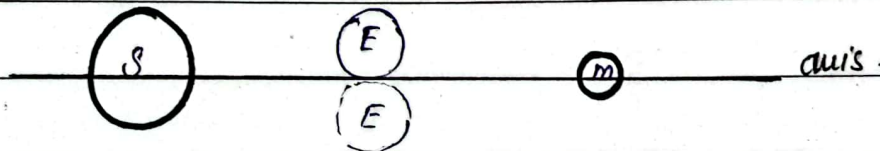
When Earth is exactly aligned on the same line, joining the centre of Sun and moon, it is known as

total lunar eclipse.



(iii) Partial lunar eclipse:

When the Moon is above or below the axis line joining the centre of Sun and moon, it is known as partial lunar eclipse.



(b)

Function of Enzymes:-

Enzymes:

"Enzymes are the globular proteins which help to run the metabolic activities."

Enzymes are the biological catalysts.

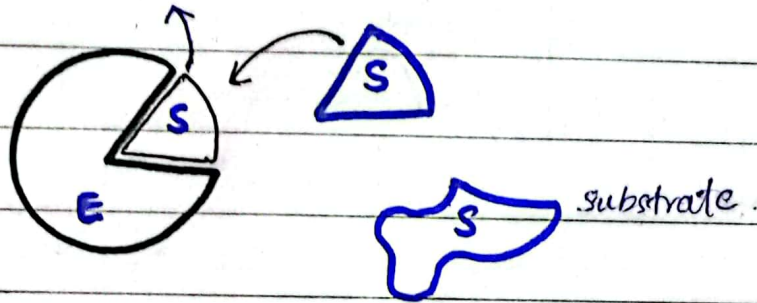
Functions of Enzymes:

- (i) They speed up the rate of reaction.
- (ii) Small proportion of enzymes can catalyse or run a chemical reaction.

- (iii) They do not influence the nature of product.
- (iv) Participate in a chemical reaction to just speed up the reaction.
- (v) They are reusable.
- (vi) They are highly sensitive to the temperature, pH concentration.

Diagram:

active site rigid in nature.



According to the lock and key model, the active side of enzyme is rigid, it only allows such substrate which is identical.



(c)

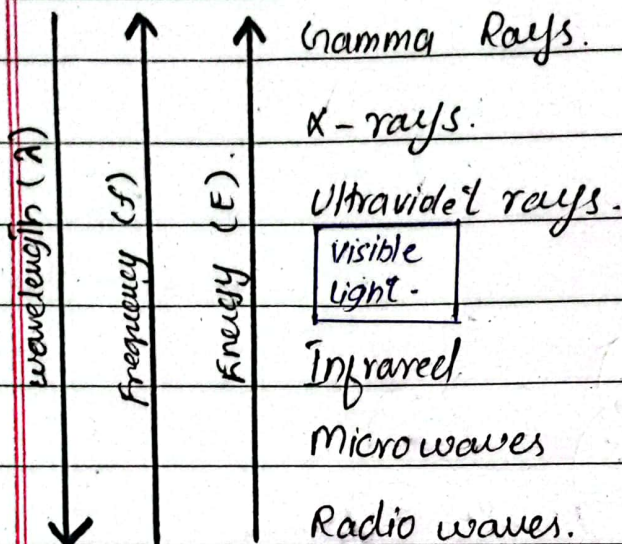
Electromagnetic radiations:-

Defination:

"It is a stream of photons travelling with speed of light in vacume or air."

According to the Planck The Energy of electromagnetic radiations is ' $E = hf$ ', where ' h ' is The plank's constant.

Spectrum of electromagnetic radiations:



We can see from the above diagram that Gamma rays has the highest Energy and frequency, but lowest wavelength. And Radio waves has the highest wavelength but lowest energy and frequency.

(d)

Are earthquakes and volcanic eruption interconnected? if yes, then how?

Yes, earth-quake and volcanic eruption are interconnected primarily, because they both involve movements within the Earth's

crust and mantle.

How they are linked:

(i) Tectonic plates movement

Earthquake usually occur along the boundaries, where plates collide, pull apart, or slide each other. These boundaries also host volcanoes.

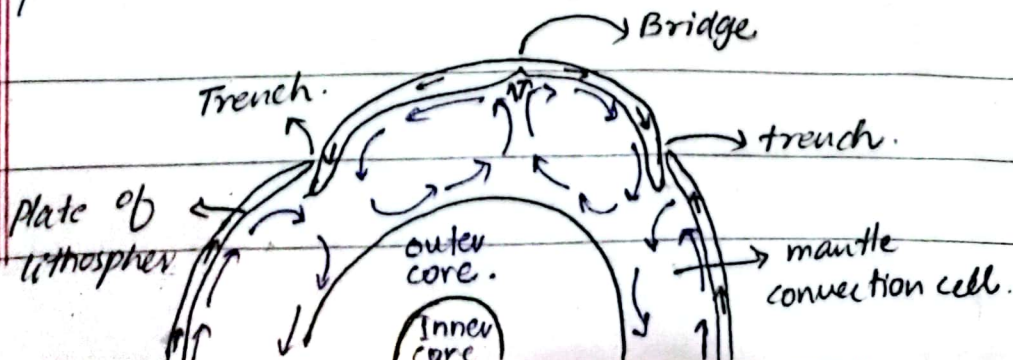
Earthquake can trigger volcanic eruption by creating additional stress in volcanic regions.

(ii) Pressure Changes

Earthquake can cause changes in pressure and stress around a magma chamber, which can destabilize it. This leads to the fracturing of rocks, allowing magma to move out.

(iii) Volcanic Earthquakes

Before a volcanic eruption, small earthquake occurs as magma rises through cracks in the Earth's crust, exerting pressure on surrounding rocks.



Question no: 4.

(a)

Noise Pollution:

"The presence of unwanted or harmful sounds in the environment is known as noise pollution."

Sources:

- Industrial activities such as mining operations, factories construction.
- sound of loudspeakers, public events, household gadgets.
- Traffic on roads, air ports produces specific noise pollution.

Effects of noise pollution:

- noise pollution can lead to stress, hearing loss, sleep disturbances.
- It also can disrupt animal's communication, hunting, especially for species that rely on sound.
- It can hinder concentration and productivity in workplaces and schools.

Ways to control:

- Design quiet zones around hospitals and schools.
- Install noise barriers or insulation in buildings.
- Impose noise limits on industries, construction and vehicles.

(d)

Lithosphere:

Lithosphere is the rigid outer layer of Earth's crust, consisting of the crust and upper mantle, and it is broken into tectonic plates.

Plate tectonics:

The earth crust divided into twelve major plates.