

General Science And Ability

Part - II

~~Section - A B~~

Answer no. 2

— (b) —

Smog and its Types

“Smog is the combination of industrial smoke and naturally occurring fog”

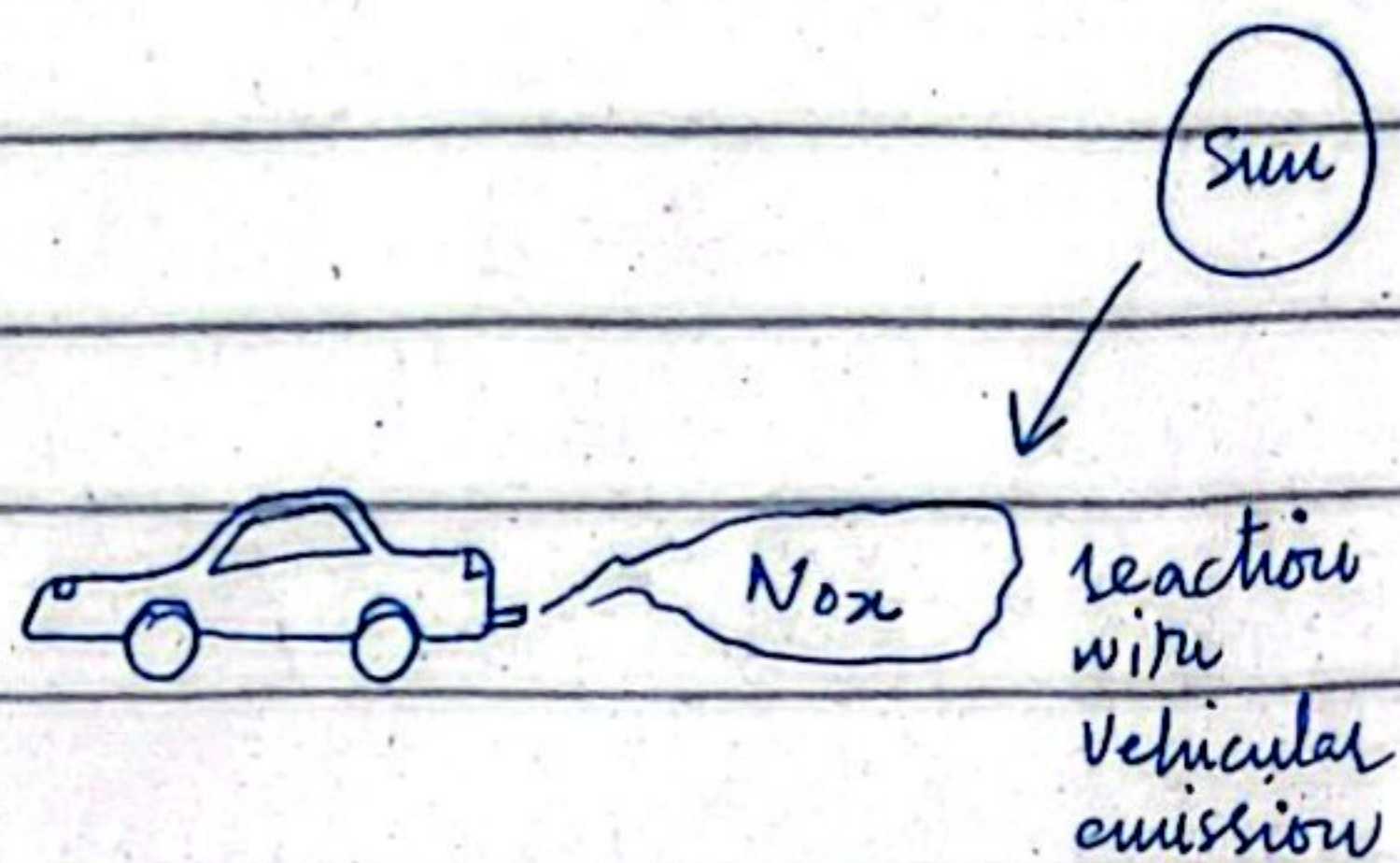
Types

Smog has two types; which are as follows:

a. Photochemical Smog

“This type of smog occurs when sunlight reacts with vehicles

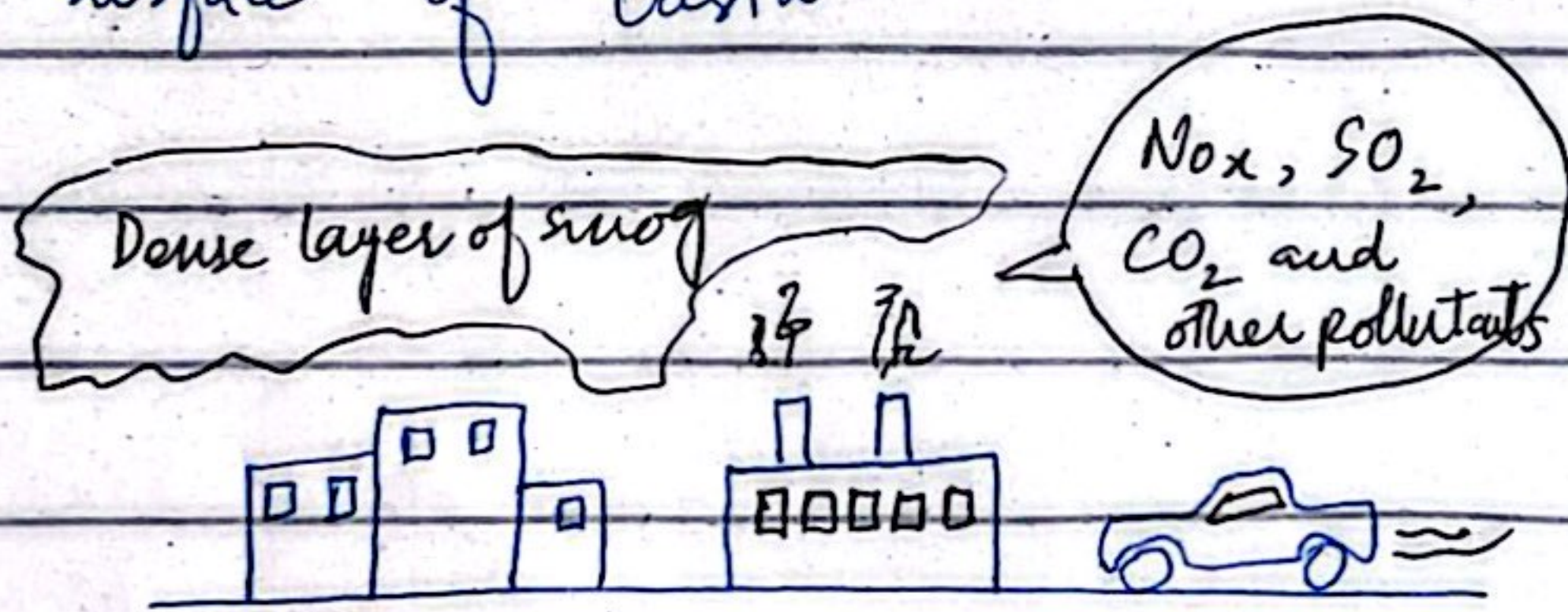
emission such as NO_x "



(Illustration of Photochemical Smog)

b. Industrial Smog

" This type of smog occurs when primary and secondary air pollutants from industries and vehicles combine with the fog to create a thick and dense layer of smog above the surface of Earth"



In conclusion, smog can cause serious health issues for people with respiratory illnesses and according Air Quality Initiative - 2023, it can shave off 4.4 years from life expectancy. Smog issue demands immediate attention from the authorities.

— (a) —

Igneous and Metamorphic Rocks

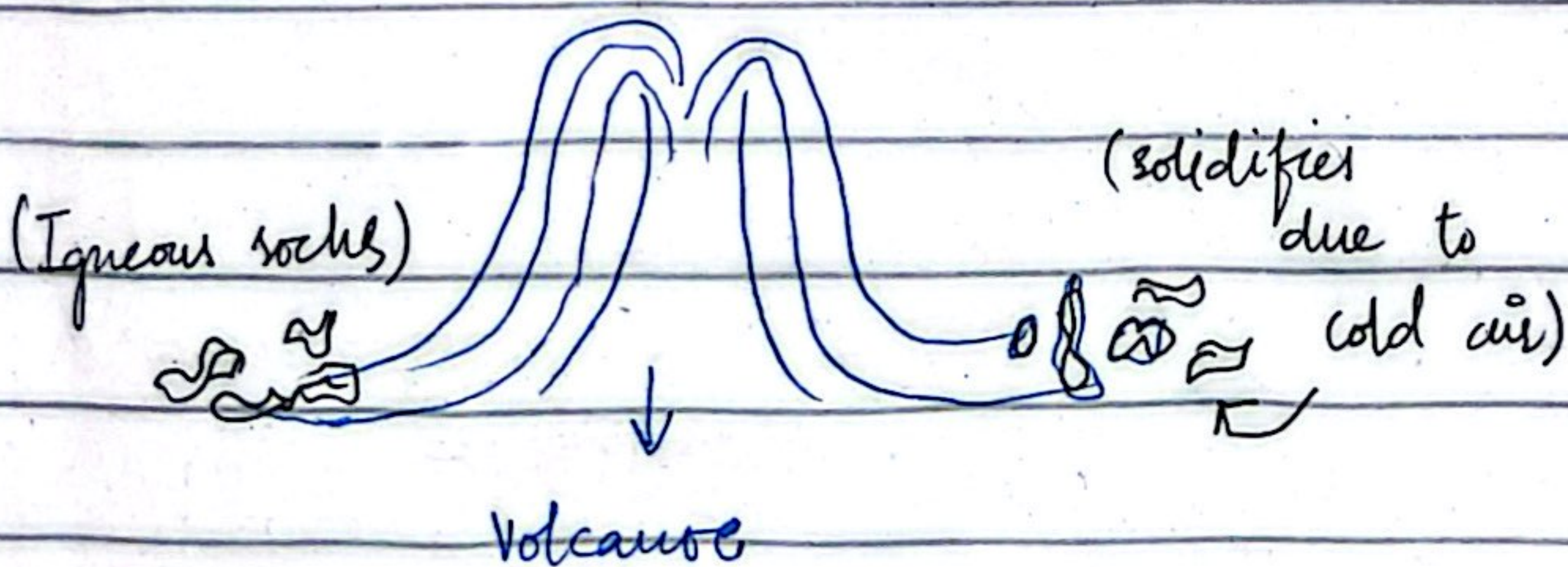
"Rocks are the main elements of our lithosphere, which are formed by number of process such as volcanic activity, deposition of sediments or through a process called metamorphism"

Igneous Rocks

Igneous rocks are formed when lava erupts from the earth's inner structure due to a volcanic activity.

Formation

When the erupted liquid (in molten form) solidifies, it form igneous rocks.



Metamorphic Rocks

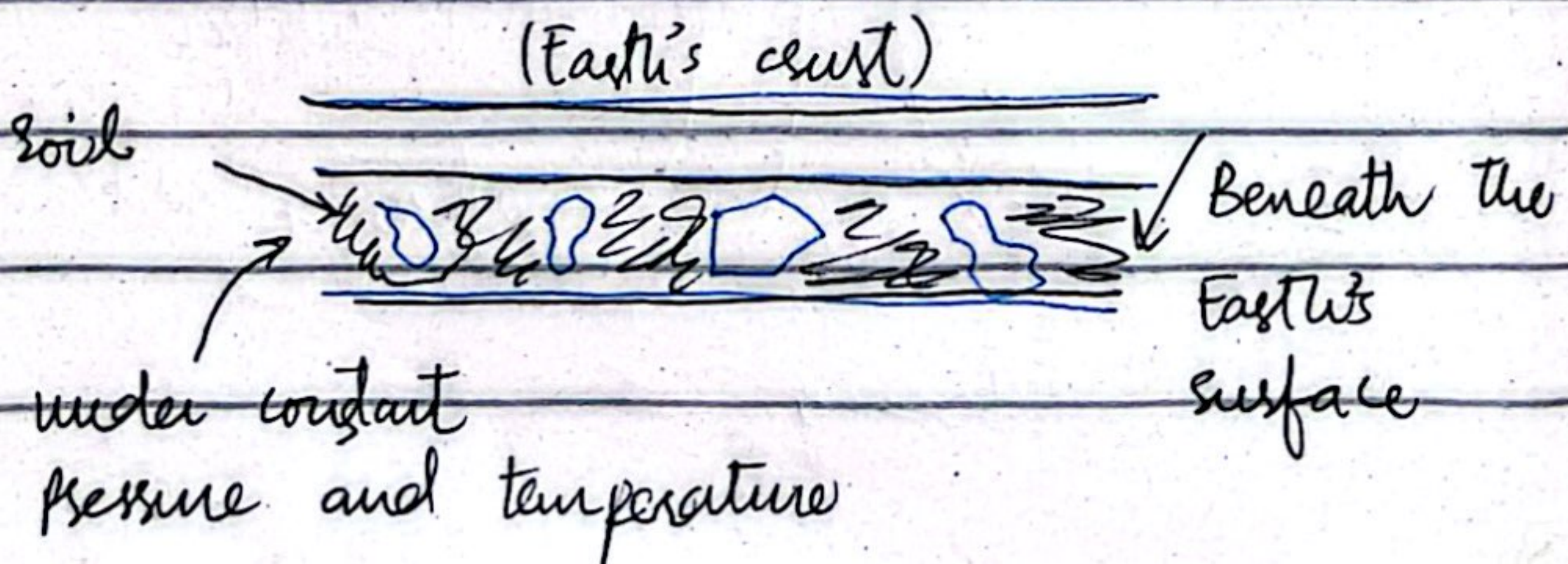
Metamorphic rocks takes a very long time for formation and they are formed through a process called metamorphosis.

Formation

When igneous or sedimentary rocks remain beneath the earth and are shaped by temperature or pressure, they form a metamorphic rocks.

Example

Marble is a kind of metamorphic rock, and it is valuable because it can take upto thousand years to form marble. For instance, Taj Mahal is formed of marble which is very precious.



—(c)—

Disaster Risk Management

“Disaster Risk Management importance can not be understated in the wake of climate change. Disaster Risk Management deals with the proactive response to any potential disaster and then also manages the post-disaster recovery, rehabilitation and reconstruction”

Importance of Disaster Management with special focus on Risk Management.

a. Early warning system can minimize risk (financial and Human)

Using early warning system in case of floods, cyclones or tsunamis can help mitigate the risk associated to them.

For instance, the floods of 2022 showed of 8 pc of GDP, lost 1700 lives and displaced million. If the risk management

were adequately done by NDMA, then situation could be very different.

b. Risk Management can preserve biodiversity

Not only, humans but animals are also affected by natural disasters such as livestock. Adequate management of risk can preserve biodiversity.

c. Risk Management can extend social health of a group

Similarly, when millions of people are affected when struck by a disaster such as losing loved ones, property and displacement, it affects their mental health.

Conclusion

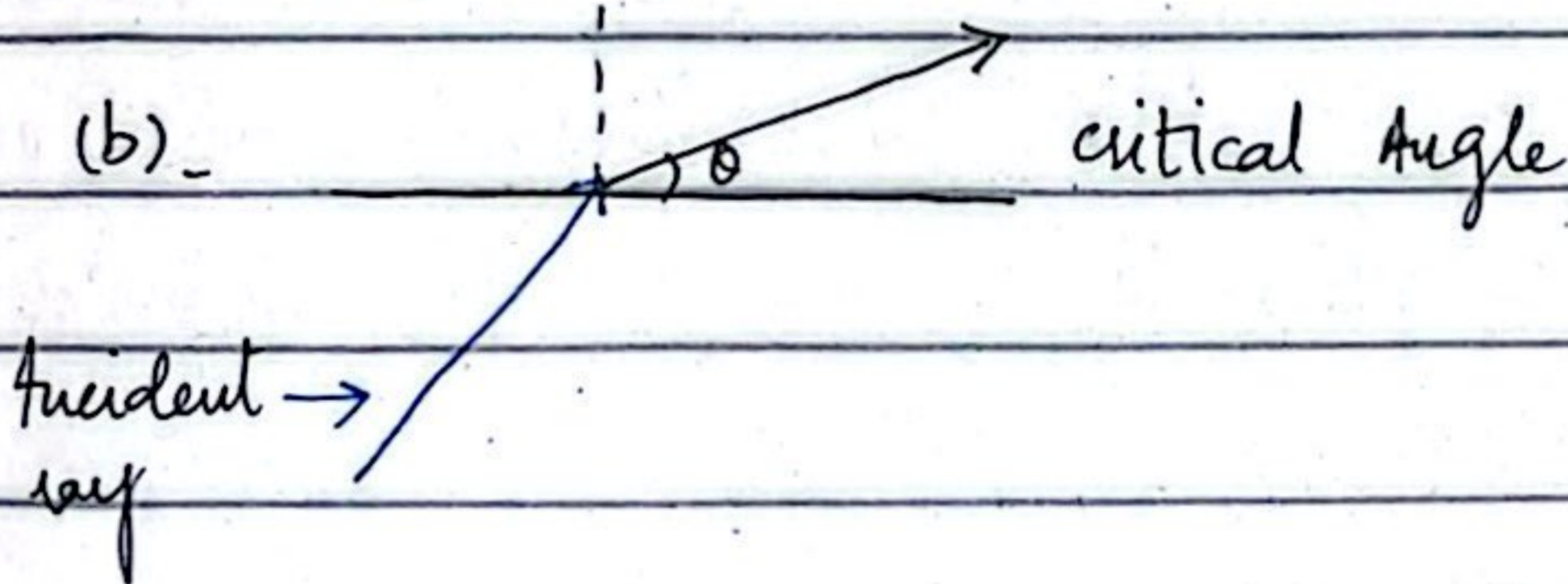
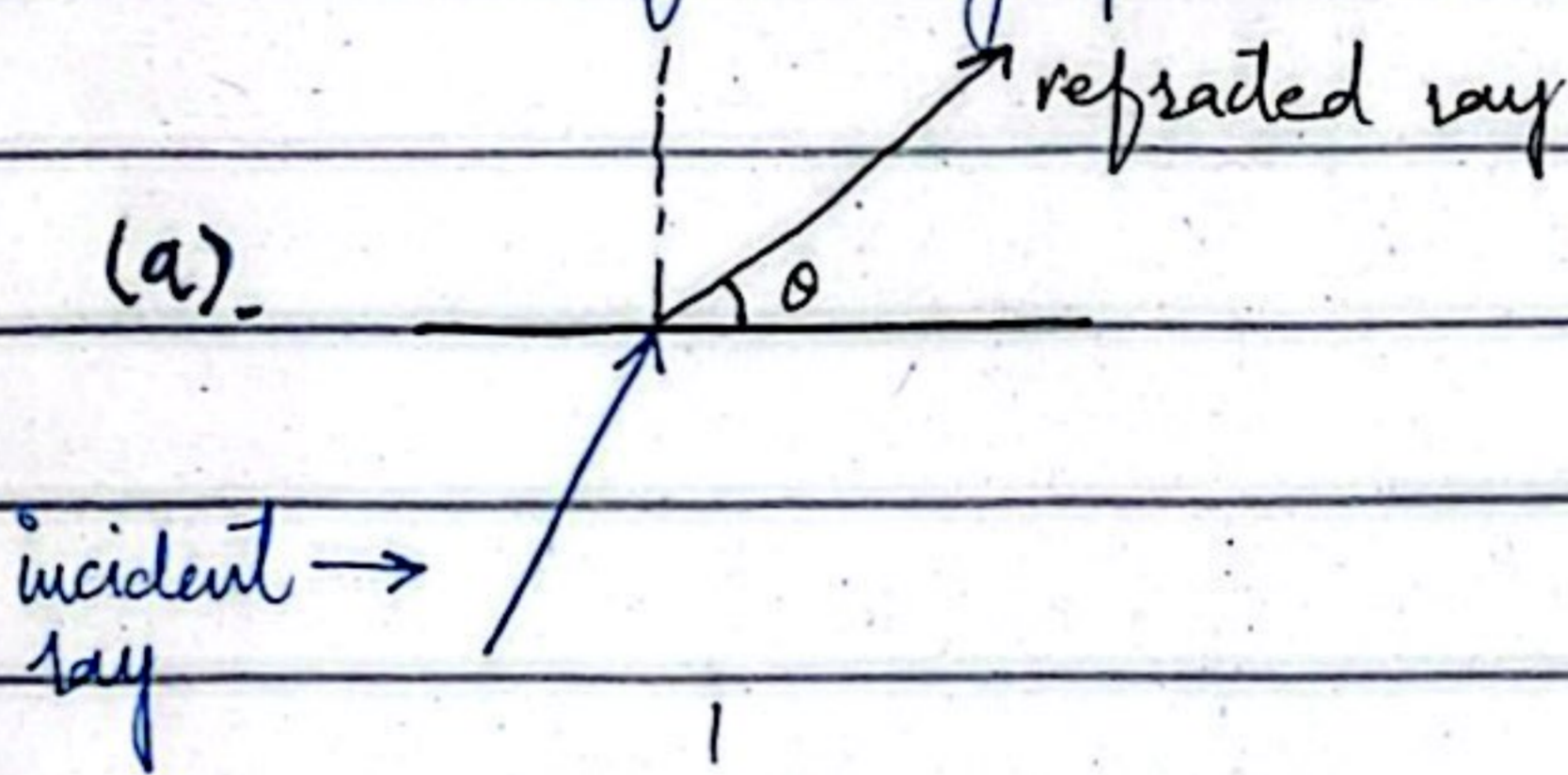
In conclusion, adequate management of risk is very vital to safeguard the social fabric of society. Otherwise, poor risk management can cause serious damage to social and economic condition of Pakistan.

Answer no. 5

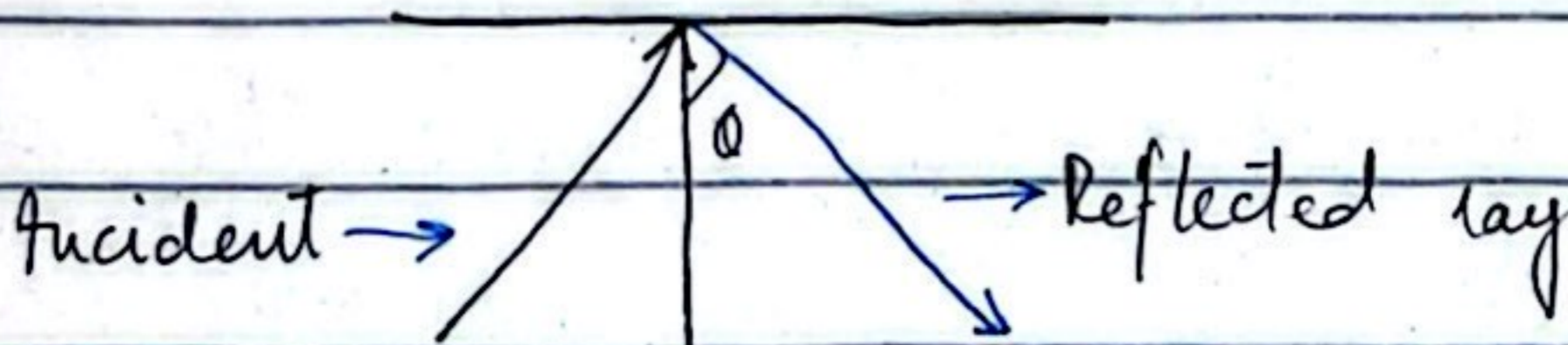
— (b) —

Working of optical fibre

To understand the working of optical fibre, it is necessary to understand the following phenomenon;



(c). Total internal reflection

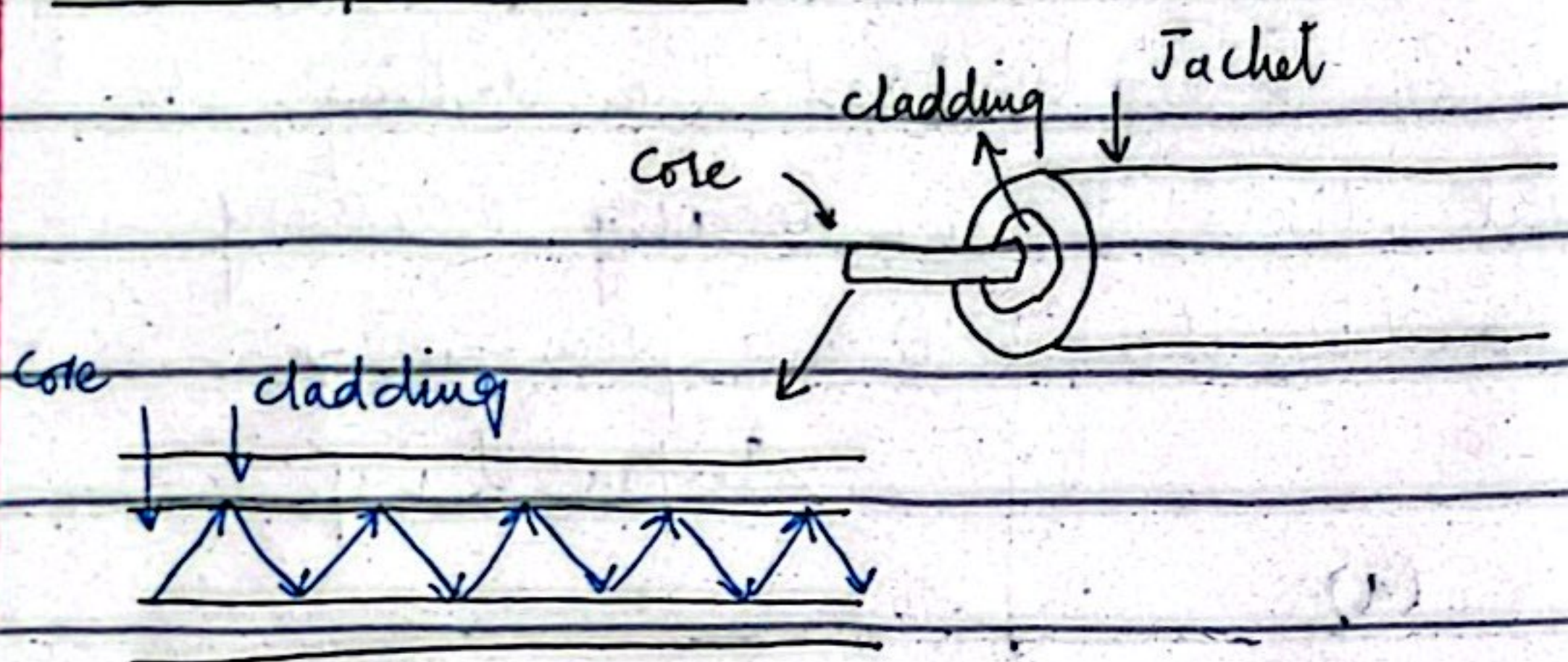


Fibre optics works on the phenomenon

of Total Internal Reflection.

To get a better understanding, a diagram of fibre optic cable is drawn;

Fibre Optical Cable



"Fibre optical cable is made up of glass or plastic fibres, which is responsible for high speed transmission", whereas fibre optics is a branch of computer sciences."

Conclusion

In conclusion, when light enters (radiation) rather than escaping, it is totally reflected back and this cycle continues. Fibre optical cable is an expensive technology due to its installation effort and cost.

—(d)—

Food Preservatives and Additives

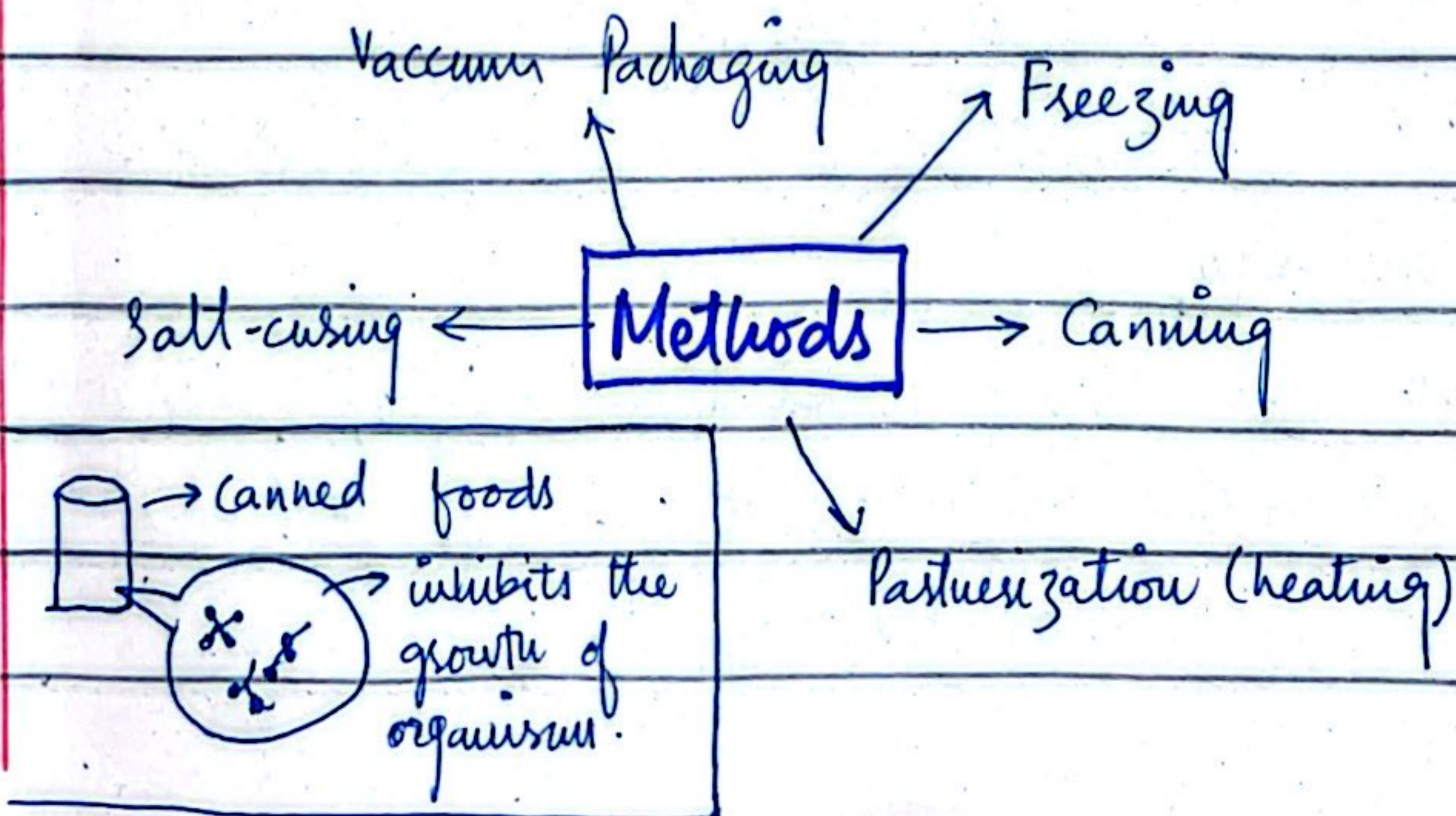
Food Preservatives

"Food preservatives are used to prevent spoilage and extend shelf life as they inhibit the growth of harmful micro-organisms such as bacteria, yeasts and fungi"

Food preservatives are also known as anti-microbials.

Example

Some example of preservatives include Potassium Sorbate and Sodium Benzoate.



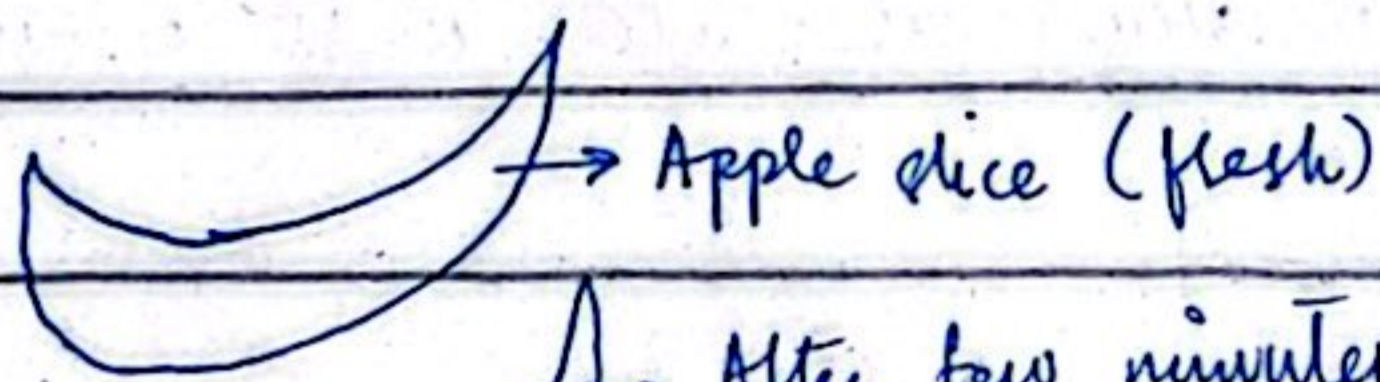
Food Additives

Food Additives covers a wide range of substances such as preservatives, anti-oxidants etc that can be used for preservation, anti oxidation, changing colour, taste, thickness (density) etc.

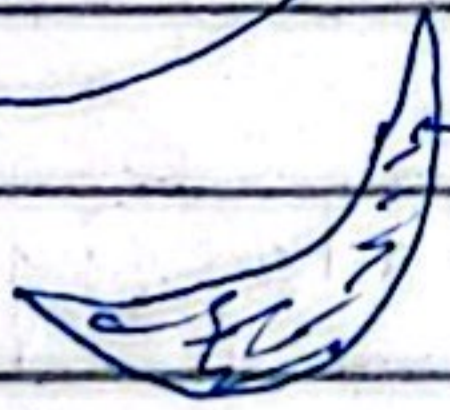
Example

Food colours, starch, salt are some common examples of food additives. Whereas antioxidants like Vitamin C (Ascorbic Acid), Tocopherol, BHT, BGT can also be used.

(Illustration of an Apple Slice):



→ Apple slice (fresh)



→ After few minutes oxidation starts, so it can be avoided using food additives

Conclusion

In conclusion, food additives and preservatives are crucial substances that can be used to preserve food for long time.

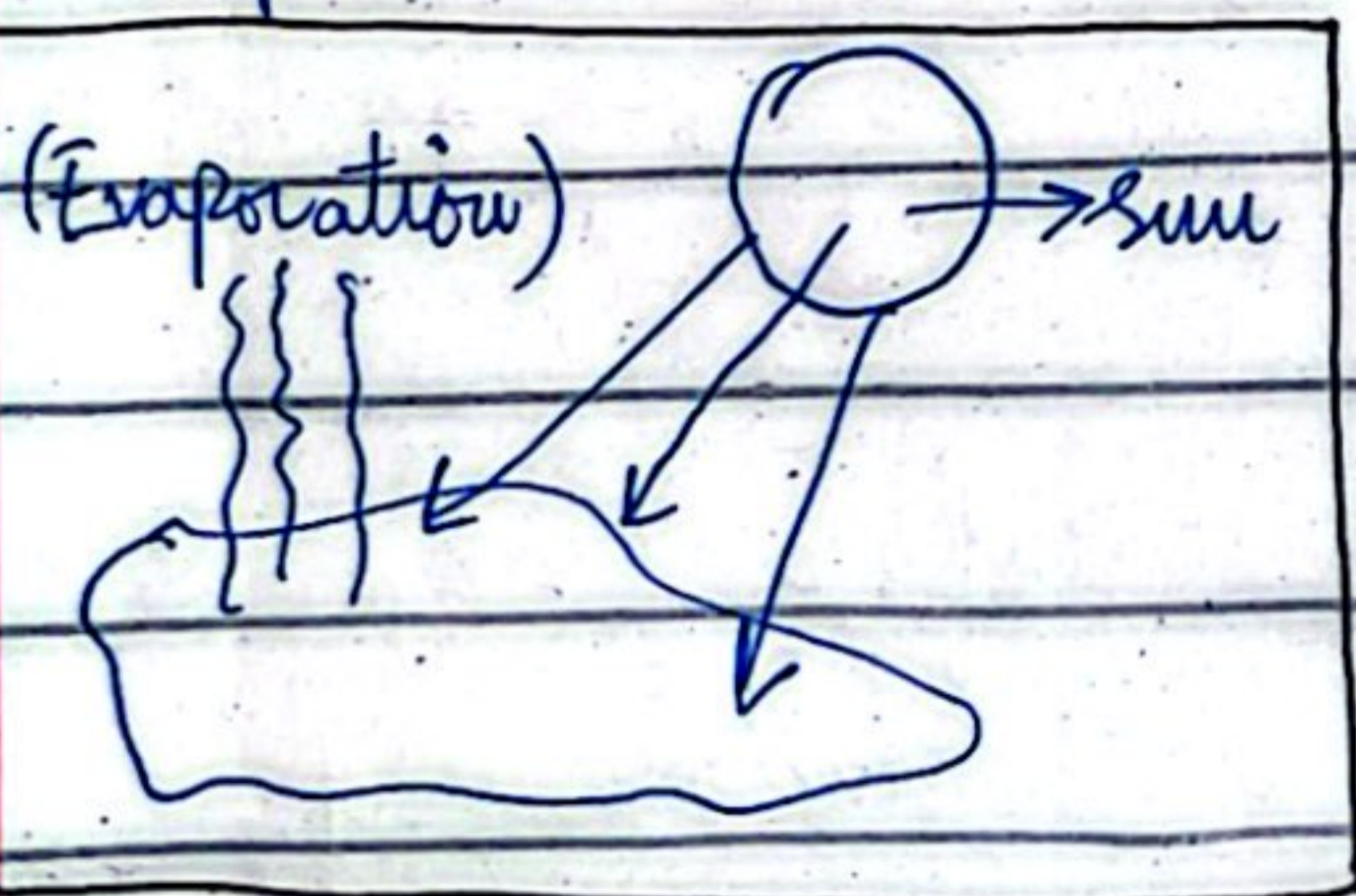
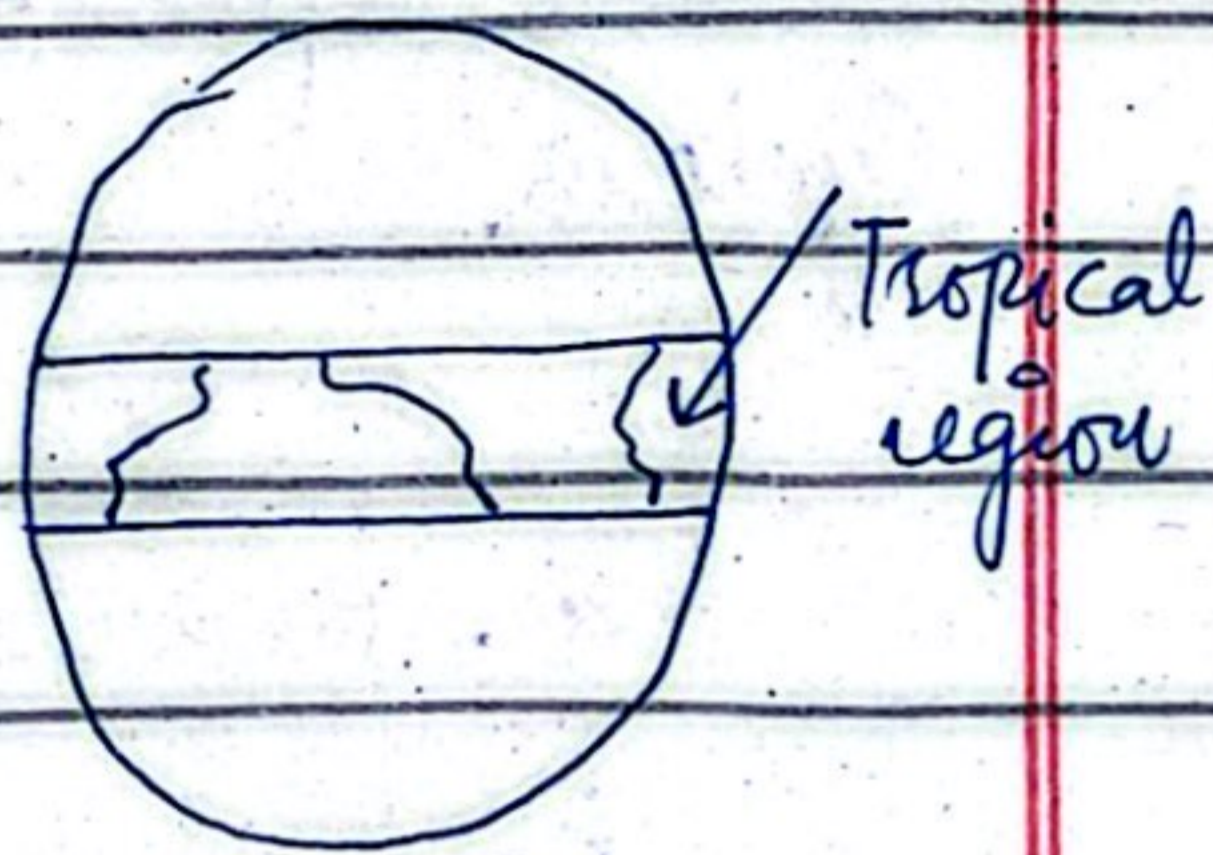
—(a)—

Sea Surface Temperature's role in formation of Tropical Cyclone

Tropical region is a part of earth's surface where the sunlight reaches the most, thus contributing to its high temperature.

Rise of Sea Surface Temperature

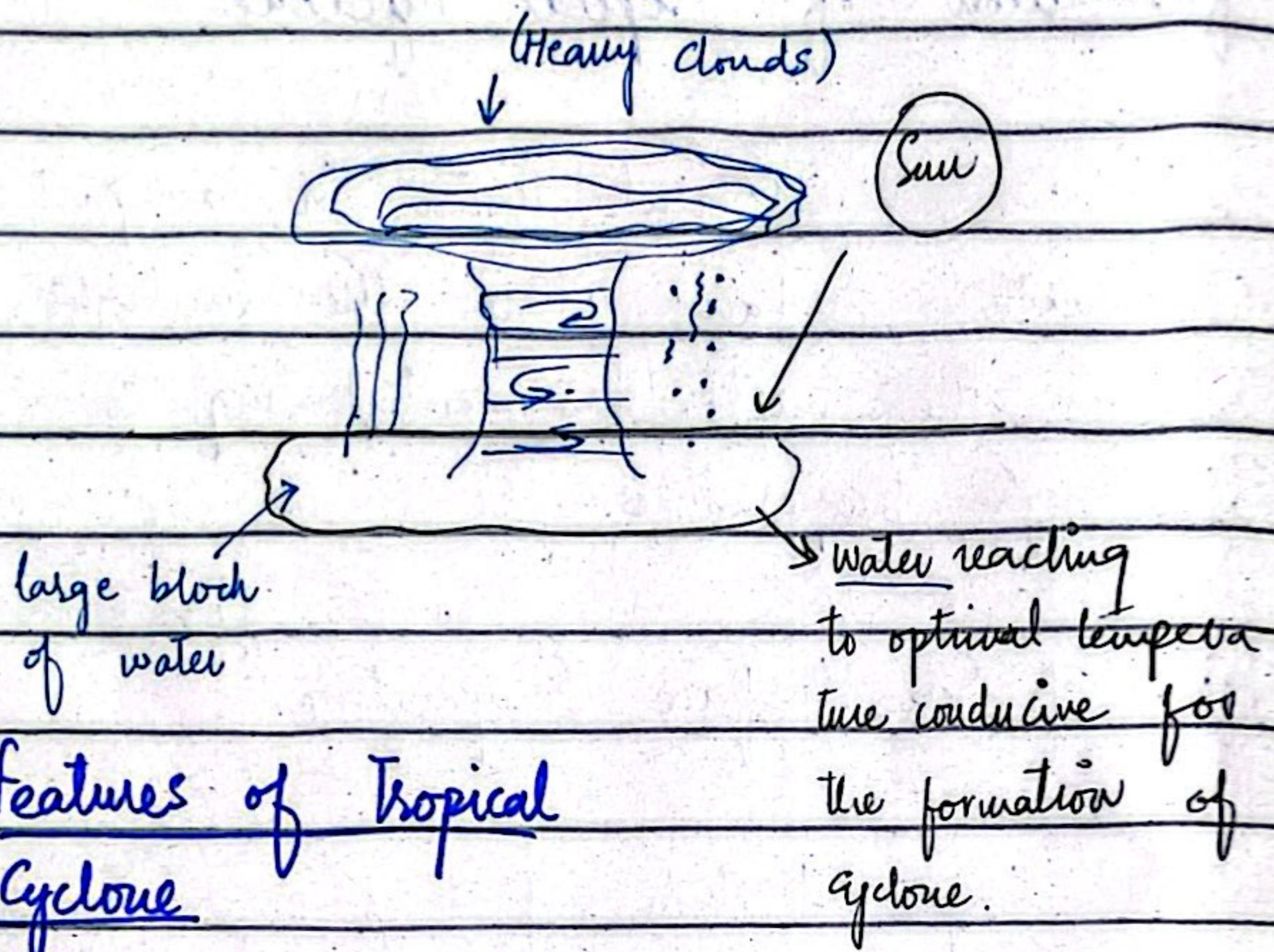
When large and still block of water is continuously exposed to sunlight, then its temperature starts to rise.



Due to which, water starts to evaporate and the cycle of water begins to form.

Then large and heavy clouds are formed accompanied by heavy precipitation,

which is then combined by a Coriolis force leading to the formation of cyclone.



Features of Tropical Cyclone

- a. Happens only in Tropical region
- b. Requires optimal water temperature
- c. Enough Coriolis force

Conclusion

In conclusion, sea surface temperature is indeed affects the formation of tropical cyclone, because it makes the environment conducive for such phenomenon to occur.

Section - B

Answer no. 7

-(a)-

Data Given

Average of 7 consecutive number
is 20

To find

Find the largest of these numbers

Solution

Let, seven consecutive numbers as follows;

x	1 st
$x+1$	2 nd
$x+2$	3 rd
$x+3$	4 th
$x+4$	5 th
$x+5$	6 th
$x+6$	7 th

Average of seven consecutive number is 20.

Therefore,

$$\frac{x + x + 1 + x + 2 + x + 3 + x + 4 + x + 5 + x + 6}{7} = 20$$

Now,

$$7x + 21 = 20 \times 7$$

So,

$$7x + 21 = 20 \times 7$$

$$7x + 21 = 140$$

$$7x = 140 - 21$$

$$7x = 119$$

$$x = 17$$

$$\begin{array}{r} 17 \\ 7 \overline{) 119} \\ \underline{7} \\ 19 \end{array}$$

So, the numbers after finding the first number are as follows;

17, 18, 19, 20, 21, 22, 23

Answer

23 is the largest number of all the consecutive seven numbers.

— (b) —

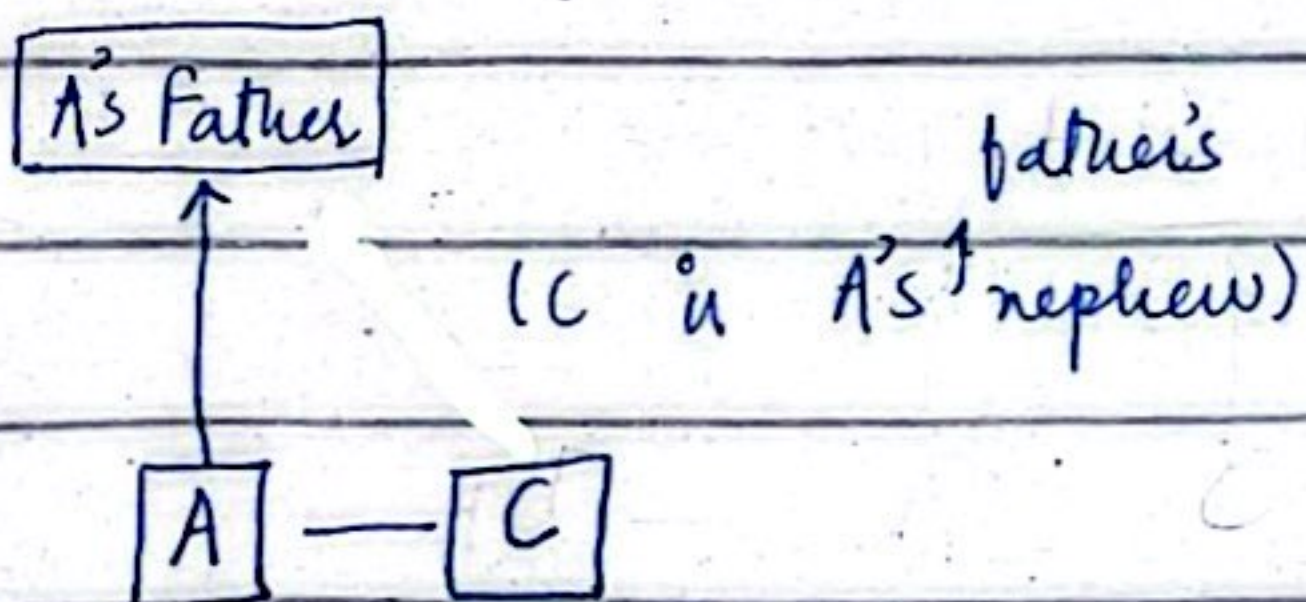
Data given

- i. A told B that C is his father's nephew.
- ii. D is A's cousin but not the brother of C.

To find

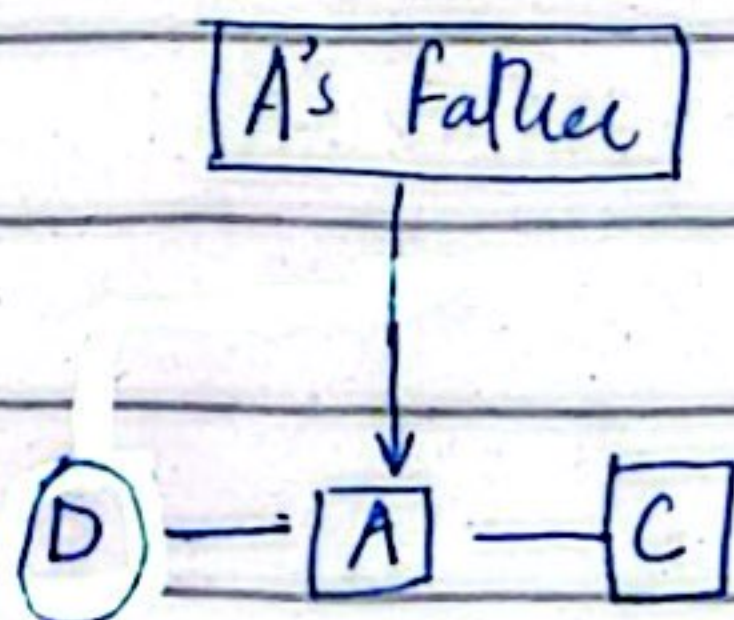
Relationship between B and C.

Solution



As, C is A's father nephew, it confirms its gender as a male

Now, D is A's cousin but not brother of C.



Since, D is not the brother of C, which means D can be the sister of C.

Answer

D and C has a relationship of brother and sister. Where C is the brother and D is his sister.

-(c)-

Missing Number in the Sequence.

(a). 4, 18, —, 100, 180, 294, 448

(Unsolved)

P. TO

(d).

13, 24, 46, 90, 178, _____

	13
$13 + 13 = 26 - 2 = 24$	24
$24 + 24 = 48 - 2 = 46$	46
$46 + 46 = 92 - 2 = 90$	90
$90 + 90 = 180 - 2 = 178$	178
$178 + 178 = 356 - 2 = 354$	354

The, missing number is 354.

—(d)—

Data Given

$$A : B = 1 : 2$$

$$B : C = 3 : 2$$

$$C : D = 3 : 4$$

and,

the difference in the shares of
A and D is 2240.

To find

What is the share of B in rupees?

Solution

We can write the given data in
the following form as

$$a : b = c : d$$

So,

$$A : B = 1 : 2 \quad ; \quad B = 2A \quad - \textcircled{1}$$

$$B : C = 3 : 2 \quad ; \quad 3C = 2B \quad - \textcircled{2}$$

and

$$C : D = 3 : 4$$

$$3D = 4C \quad \text{--- (3)}$$

Now

Now putting value of B into eq (2)
we get,

$$3C = 2(2A)$$

$$3C = 4A$$

$$C = \frac{4A}{3} \quad \text{--- (4)}$$

Now putting value of C into eq (3)

$$3D = 4\left(\frac{4A}{3}\right)$$

$$D = \frac{16A}{9}$$

Now, there difference between D and A
is 2240.

$$D - A = 2240 \quad \text{--- (5)}$$

$$\frac{16A}{9} - A = 2240$$

$$\frac{16A - 9A}{9} = 2240$$

$$7A = 2240 \times 9$$

$$7A = 20160$$

$$A = \frac{20160}{7} \Rightarrow 2880$$

Now to find share of B in super
we need to put A's value in eq ①

$$B = 2A$$

$$B = 2(2880)$$

$$\begin{array}{r} 2880 \\ \times 2 \\ \hline \end{array}$$

$$5760$$

$$B = \text{Rs. } 5760$$

Answer

The share of B is Rs. 5760!

Answer no. 8

—(b)—

Jumbled Spellings

SONCCVOISIEN

The correct word is,

CONSCIENTIOUS

EIVENPROAST

UORSIULDC

The correct word is,

LUDICROUS

UNSPRESE

NMILAOPC

The correct word is,

COMPLAIN

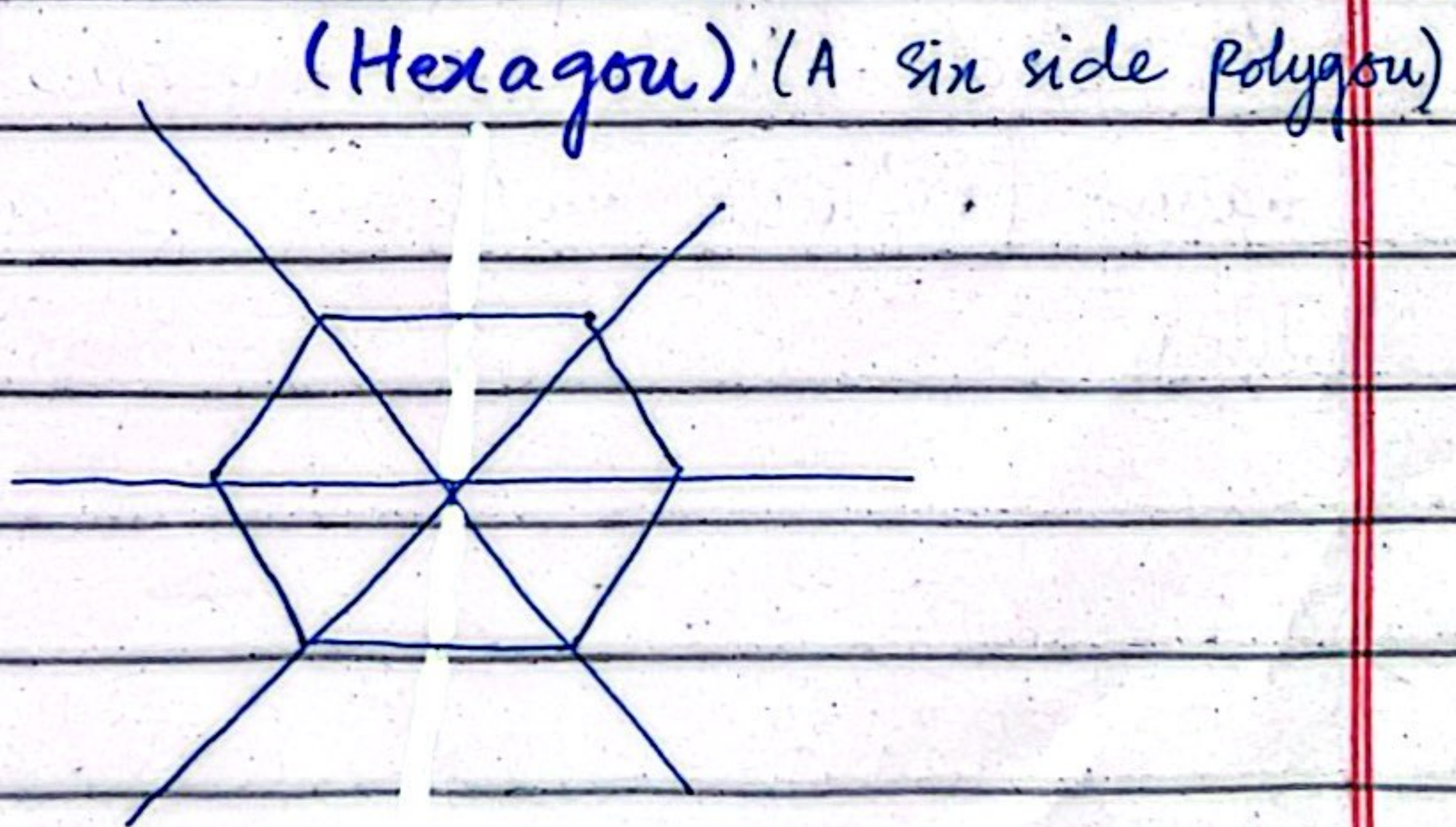
—(C)—

To find

- i. Drawing lines and writing symmetry number lines in a regular hexagon and octagon.
- ii. Lines of symmetry in a circle = ?

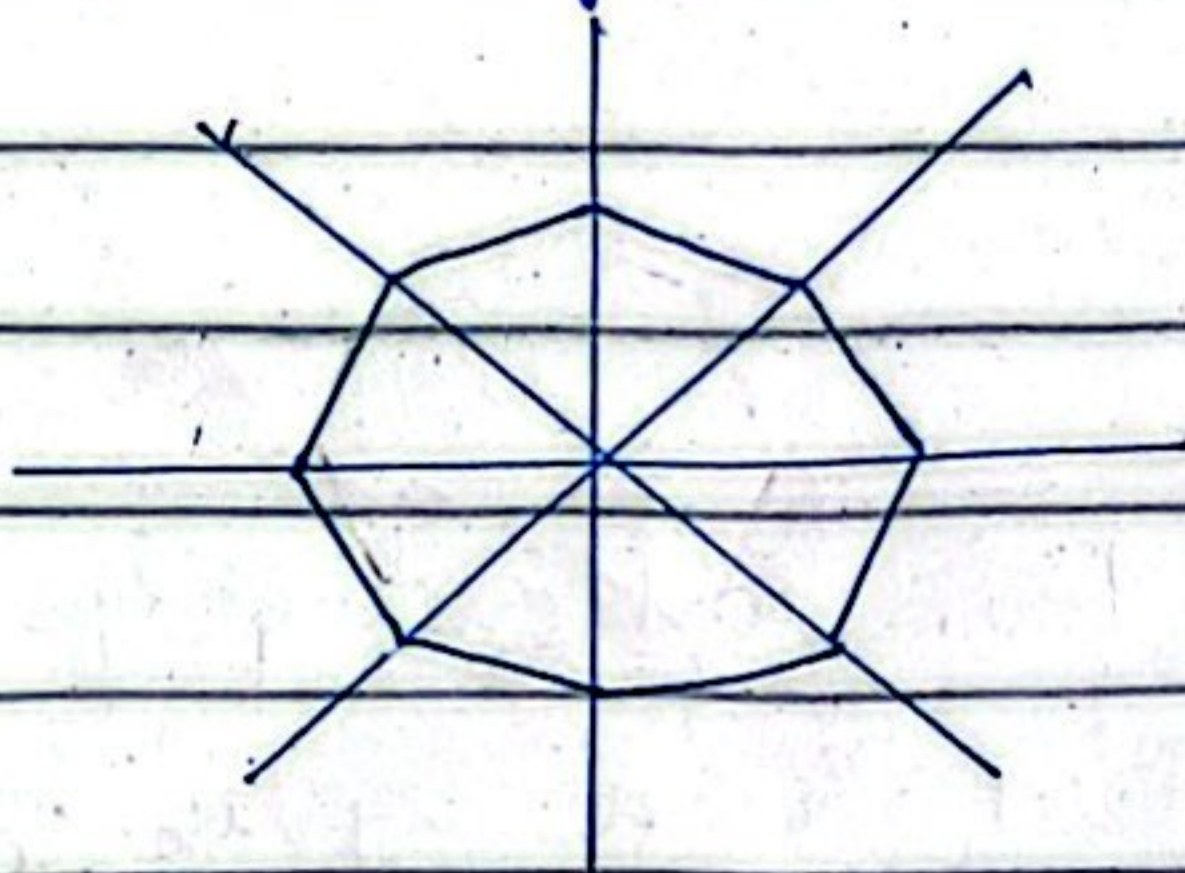
Solution

“Symmetry lines are those lines which cut a shape into equal parts”



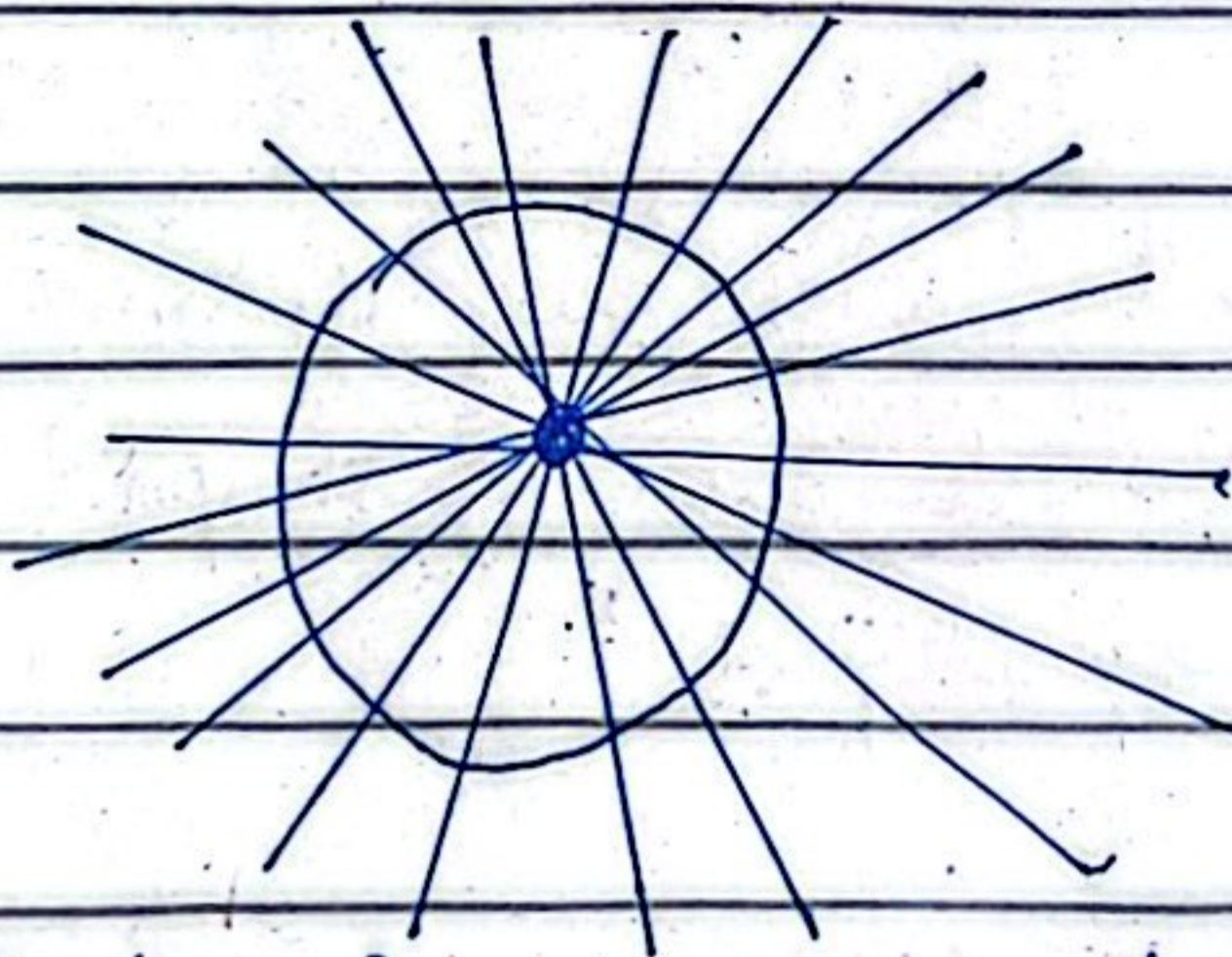
There are total 6 lines of symmetry in a regular hexagon.

(Octagon) (A eight sides polygon)



A regular octagon has 8 lines of symmetry

(Circle)



(Infinite symmetry lines)

A circle is a geo-metrical shape having infinite numbers of symmetrical lines

—(a)—

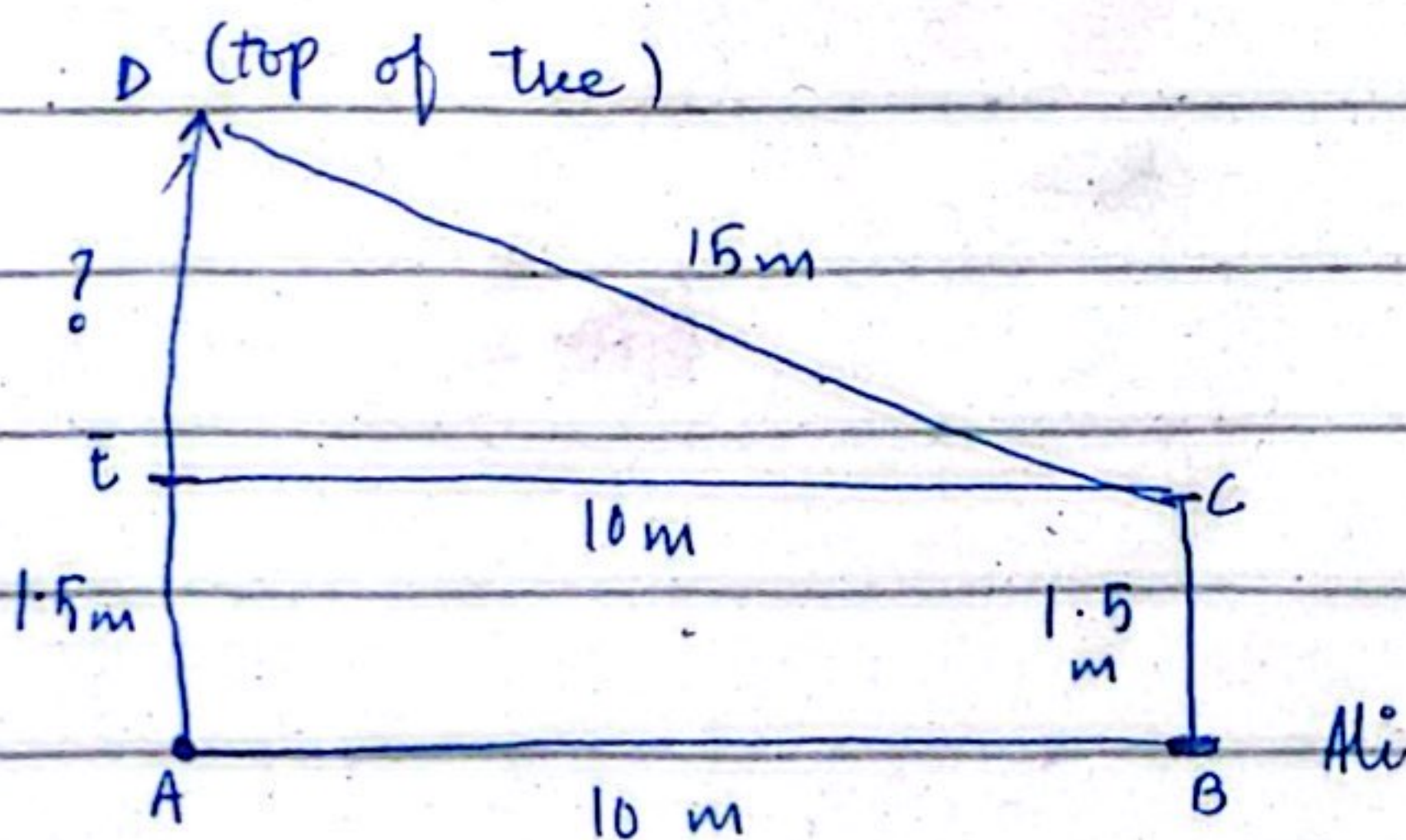
Data Given

- (i) Ali is standing 10 meters away from a tree;
- (ii) Distance of his eyes from his feet is 1.5 m
- (iii) Distance from his eyes to the top of the tree is 15 m.

To find

Find the height of tree?

Solution



Therefore,

$$\text{Height of tree} = AE + AD$$

To calculate DE, we need to apply Pythagoras theorem.

$$\therefore DC = 15 \text{ m}$$

$$EC = 10 \text{ m}$$

$$(DC)^2 = (EC)^2 + (DE)^2$$

$$(15)^2 = (10)^2 + (DE)^2$$

$$225 - 100 = (DE)^2$$

$$\sqrt{125} = \sqrt{(DE)^2}$$

$$DE = \sqrt{125}$$

$$DE \approx 11.15 \text{ (approx)}$$

Now, to calculate the height of tree;

$$h = AE +$$

$$= 1.5 + 11.15$$

$$h = 12.65 \text{ m}$$

\therefore As, square of

11 is equal to

121, therefore

it can be

deduce that

$\sqrt{125}$ would

be equal approx-

imately to

11.15.

$$11.15$$

$$+ 1.5$$

$$\hline 12.65$$

Answer

The height of tree is approximately

$$\boxed{12.65 \text{ m}}$$