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Mock GSA.

## Ability Portion

Q7a) Given

Saqib took loan = RS 1200

Interest paid = 432 Rs.

Asked Rate = ?

Solution:

Let the rate =  $x$

If at 1200 rupees 432 rupees

interest is paid then the

interest paid at 1 rupee is:

Rupees <sup>taken</sup> given : Amount paid as Interest.

$$1200 : 432$$

$$1 : x$$

$$1200x = 432$$

$$x = \frac{432}{1200}$$

$$x = \frac{9}{25}$$

Thus rate =  $\frac{9}{25}$  at 1200 rupees.



## Part b

Given:

Average of visitors = 510  
on Sunday

Average of visitors = 240  
other days

Asked:

Average number of visitors per day  
in 30 days = ?

Solution

$$\text{Average} = \frac{\text{Number of visitors per}}{\text{Total number of days.}}$$

Total Sundays = 5

$$\begin{aligned} \text{Average visitors on 5 Sundays} &= 5 \times 510 \\ &= 2550 \end{aligned}$$

Total visitors on other days = 240.

$$\text{Per day visitors} = 240 \div 6 = 40$$

In 30 days: other days =  $4 \times 240 + 40$   
Average visitors

$$= 1000$$



$$\begin{aligned}\text{Average} &= \frac{2550 + 1000}{30} \\ &= \frac{355}{3}\end{aligned}$$

$$\text{Average} = 118 \frac{1}{3}$$

### Part c

Given

If 40% of a number is equal to two-third of another number

Asked Ratio of 1st number to 2nd number

Solution

Let the 1st number =  $x$

Let the 2nd number =  $y$

$$\frac{2 \times 40}{5 \times 100} x = \frac{2}{3} y$$

$$\frac{2x}{5} = \frac{2}{3} y$$

$$6x = 10y$$

$$\frac{x}{y} = \frac{10^5}{63} \Rightarrow \frac{x}{y} = \frac{5}{3}$$



Hence Ratio = 5:3

### Part d

Given

Two dices thrown simultaneously

Asked

Probability of getting two numbers whose product is even.

Solution

$$\text{Probability} = \frac{\text{Possible outcome}}{\text{Total number of outcomes}}$$

$$\text{Probability of even product} = \frac{27}{36}$$

Sample space:

$1 \times 2, 1 \times 4, 1 \times 6, 2 \times 1, 2 \times 2, 2 \times 3, 2 \times 4,$   
 $2 \times 5, 2 \times 6, 3 \times 2, 3 \times 4, 3 \times 6, 4 \times 1, 4 \times 2, 4 \times 3,$   
 $4 \times 4, 4 \times 5, 4 \times 6, 5 \times 2, 5 \times 4, 5 \times 6, 6 \times 1, 6 \times 2,$   
 $6 \times 3, 6 \times 4, 6 \times 5, 6 \times 6.$

$$\text{Probability} = \frac{27}{6 \times 6} = \frac{27}{36} = \frac{9}{12} = \frac{3}{4}$$

Hence probability =  $\frac{3}{4}$ .



## Question 8

### Part a

Given:

$$\text{Length : Breadth} = 3 : 2$$

$$\text{Speed} = 12 \text{ km/h}$$

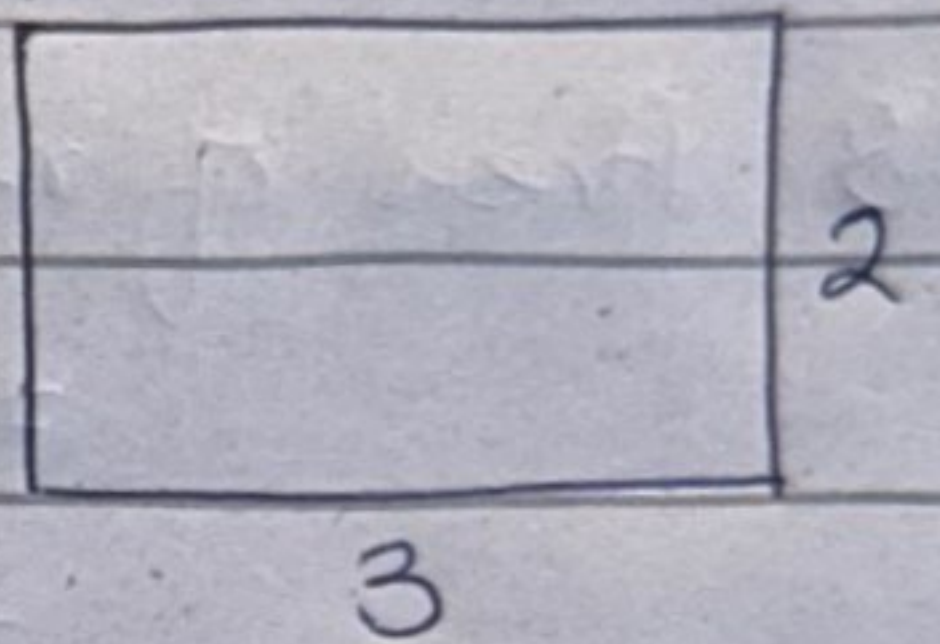
$$\text{time} = 8 \text{ minutes}$$

Asked

Area in  $\text{m}^2$

Solution

Let distance =  $d$



$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{time} = \frac{8}{60} = \frac{2}{15} \text{ ~~minutes~~ hours}$$

$$12 = \frac{d}{(2/15)}$$

$$12 \times \frac{2}{15} = d$$

$$d = \frac{24}{15} = \frac{8}{5} \text{ km}$$

$$\frac{8}{5} \text{ km} \rightarrow \frac{8}{5} \times 1000 = 1600 \text{ m}$$



Let the total length of boundary =  $x$ .

$$3x + 2x = 1600$$

$$5x = 1600$$

$$x = \frac{1600}{5} = 320 \text{ m}$$

$$3(320) = 960 \text{ m}$$

$$2(320) = 640 \text{ m}$$

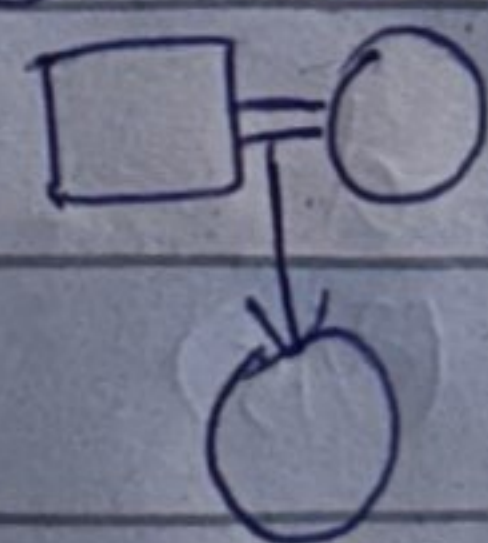
Thus Area of rectangle =  $l \times b$

$$= 960 \times 640$$

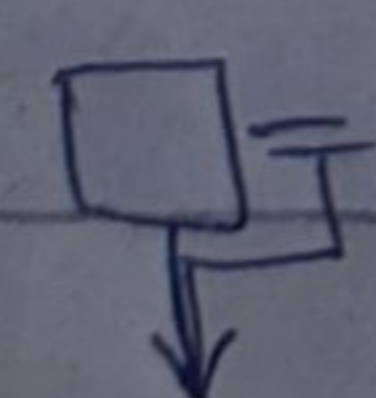
$$= 614400 \text{ m}^2$$

### Part b

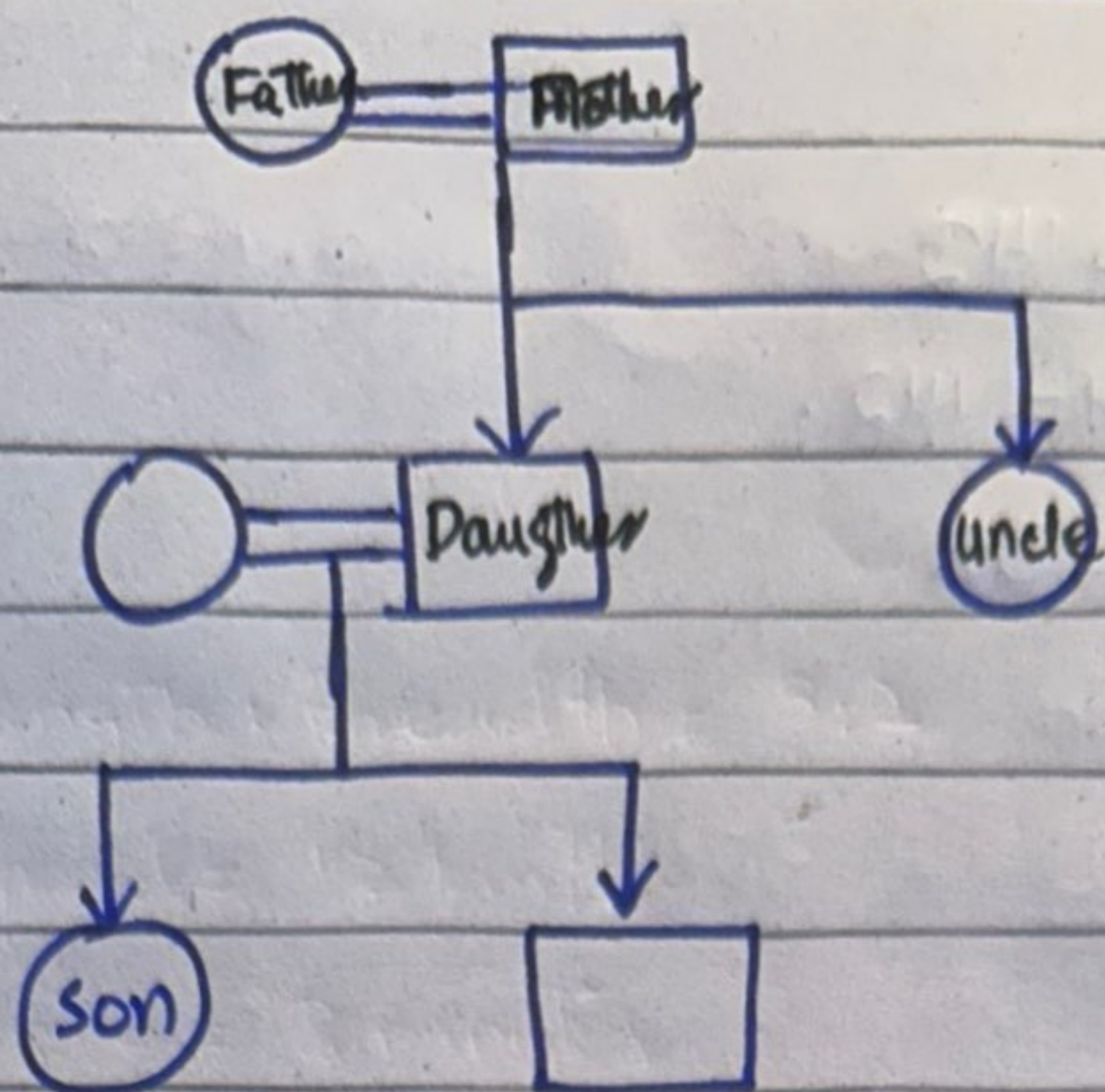
Let  $\square$  = female       $\circ$  = male

Son of the daughter: 

Let  $\square = \circ$  = husband and wife

Let  = kid





Thus, she is the sister of the boy  
that she called son.  
Hence, they are siblings

### Part C

Let the ~~unit~~<sup>ten's</sup> digit =  $x$

unit digit =  $x+2$

Product of the given number =  $x(x+2)$

Sum of its digit =  $x + x+2 = 2x+2$

$$x(x+2) + 2x+2 = 144$$

$$x^2 + 2x + 2x + 2 = 144$$

$$x^2 + 4x + 2 = 144$$

$$x^2 + 4x = 144 - 2$$

$$x^2 + 4x = 142$$

$$x(x+4) = 142$$



$$\text{either } x = 144$$

$$\text{or } x + 4 = 142$$

$$x = 138$$

Part d.

$$\text{LCM} = 48$$

let one number =  $x$

let other number =  $y$

$$\text{LCM} = xy$$

$$xy = 48$$

$$x = 48/y \rightarrow (1)$$

$$\text{Ratios} = 2:3 \quad 2+3=5$$

$$2x + 3y = 5$$

$$2\left(\frac{48}{y}\right) + 3(y) = 5$$

$$\frac{96}{y} + 3y = 5$$

$$96 + 3y^2 = 5y$$

$$3y^2 - 5y = -96$$

$$y(3y - 5) = -96$$



(3)

$$y = -96 \quad \text{or} \quad 3y - 5 = -96$$

As the numbers are not in fraction that will take  $y = -96$ .

$$\left. \begin{array}{l} \text{The sum} = 9 + 6 = 15 \\ \text{Thus sum of } x + y = 15 \end{array} \right\} x$$

Substituting  $y = -96$  in equation (1).

$$x = \frac{-48}{96}$$

$$x = -0.5$$

$$\text{Sum} \Rightarrow -96 - 0.5 = -96.5$$

... would find it.  
succeeded at his mission dem...  
odds.  
The dis...



# Section I

## Question # 5

### Part a

In past the world has sat multiple times to discuss the issue of global warming. Since 1995 in Kyoto Protocol the idea of climate finance was coined. However, the global warming needs to be addressed particularly as the world teeters on a razor's edge of volatile system. To do so following measures needs to be taken.

Why Climate Finance is key concern of developing countries?

1. Developing countries have little or no funds to transition towards renewable energy resources. Therefore, to cut carbon emissions they need to shift to renewable resources.



2. Mostly these countries are impacted severely by global warming. For instance Pakistan contributes to 1.9% Green House Gas Emission yet is in the list of top 10 most volatile countries to climate change.

3. These developing countries due to global warming are facing food crises as the climate pattern is changing. Thus, they need funds to nourish their people.

4. To educate people and demand change in lifestyle or to contribute in conservation they need funds to educate people. Thus, is demanded by developing countries.

### Pledges to be catered in coming COP30:

1. In Kyoto protocol countries demanded for reduction of or retention prevention of global temperature reaching



above  $1.5^{\circ}\text{C}$ . However, the earth's temperature has reached above  $1.5^{\circ}\text{C}$  in 2024. Now they need to discuss new targets in COP-30 and how to prevent earth from boiling.

2. The world pledge about complete elimination of fossil fuels. Each country gave their own timelines. To make sure countries abide by their commitments a mechanism of reward and punishment must be addressed.

3. The issue of carbon credits still needs clarification and it must be addressed removing structural flaws. Also focusing on bringing it into function immediately.

4. A fund was promised to be given to impacted developing countries. Though in COP 29 it was discussed yet no layout was given on when and how this fund



will be given. It should be addressed.

5. US withdrawal from Paris Agreement pushes the drive to combat climate change behind. How to approach countries and bind them to such treaties can be addressed in COP-30.

Thus the world must avoid fancy talk in COP-30 and take pragmatic measures to address the root cause of the issue.

C

## Introduction

Water is a basic necessity of life. It must be conserved as it's a precious gift. This conservation can be done in following manner.

## How to conserve water and prevent water scarcity?



1. Prevent wastage of water. Water is used in households, offices and mosques. Water must not be wasted.
2. Install water purification plants to purify contaminated water. It is an expensive method but can help prevent water scarcity.
3. Regulate through laws the conservation of water bed. Due to wells and extraction of underground water by households through a 'bore' system, water table has reduced.
4. Install De-salination plants to purify sea water.
5. Promote research and development to invent new technologies that can purify water at cheaper rates.



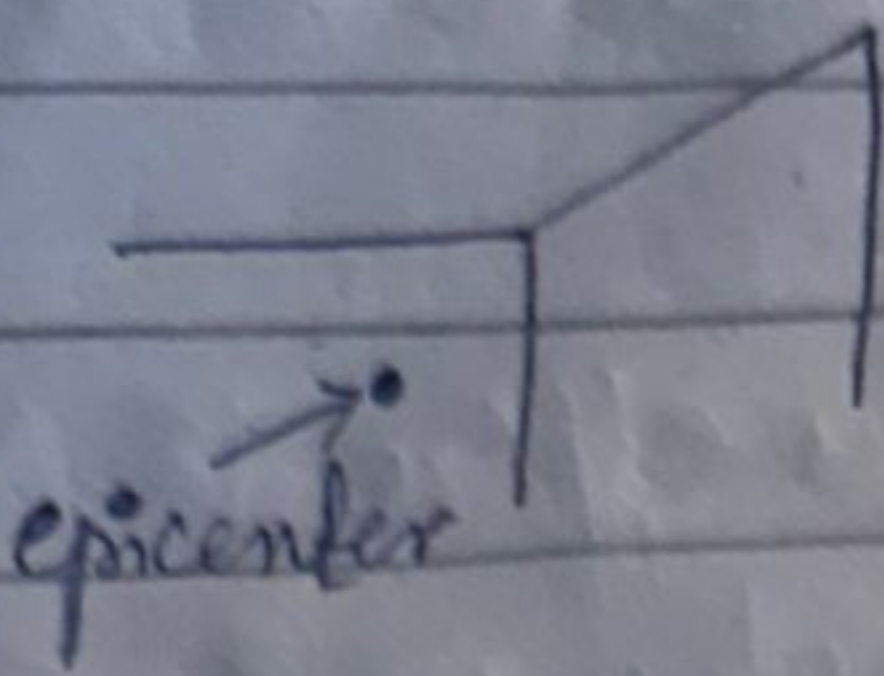
6. Prevent wastage in agriculture sector.
7. Monitor industries so their effluents do not contaminate nearby water bodies.
8. Take mitigative measures to prevent global warming and melting of ice bergs which are source of fresh water.
9. Store water in dams and barrages to be utilise for agriculture and other purposes when needed.
10. Prevent salination problem in dams so the capacity to hold water increases.

d

Eepicenter

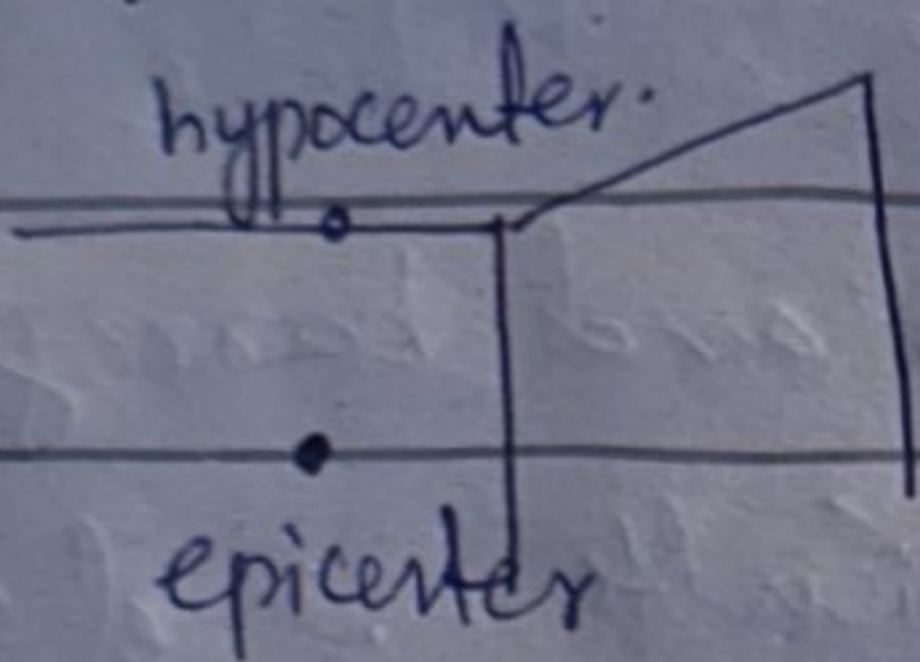
The region inside the ground from where the earthquake originates.





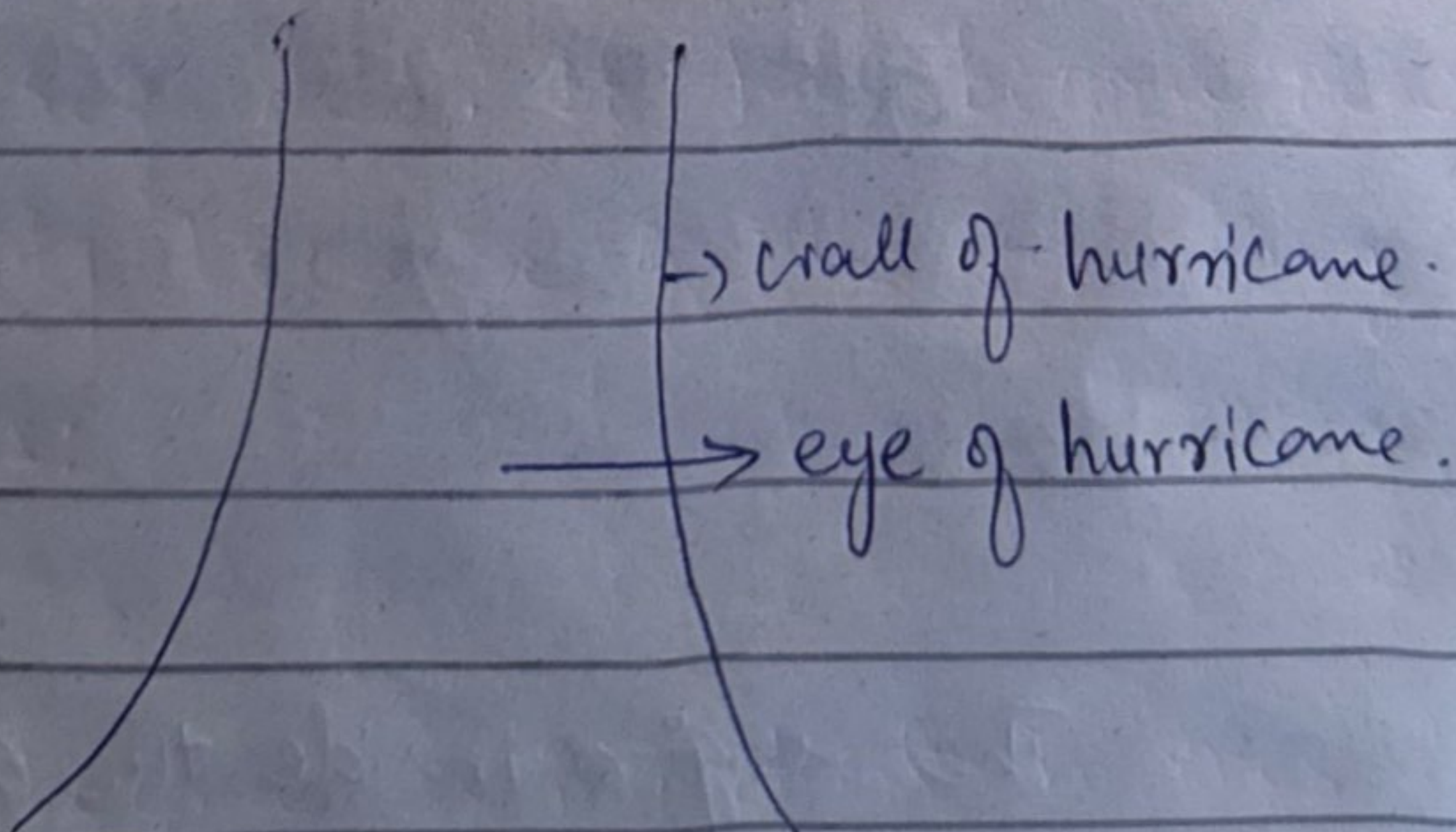
## Hypocenter

The region on surface of crust of earth that receives the shocks and is directly above epicenter.



## Eye of hurricane

It is the center of the hurricane which is the calmest.





## Shallow focus

A type of earthquake. The wave shocks are near the earth's surface.

## Parsec

The unit used to measure the magnitude of earthquake. For instance 7.5 parsec earthquake.

b	
Cyclones	Tornadoes
Originates in sea	Originates on land
Frequently occurs	Rarely occurs
Coriolis effect and change in pressure main cause of origination. Also earthquake a cause.	Change in air pressure main cause.



Mostly more destructive as causes destruction in sea and land.

Less destructive and die when enters water bodies.

## Question 2

a

Artificial intelligence has crept into our lives. It has become as important as electricity. Just like one who live without electricity is considered backward similarly one who can not use Artificial Intelligence will be regarded. It has become new electricity because of the following reasons:

1. It has become as important in ones life as electricity is.



2. Industries are relying of Artificial Intelligence just like they are relying on electricity.

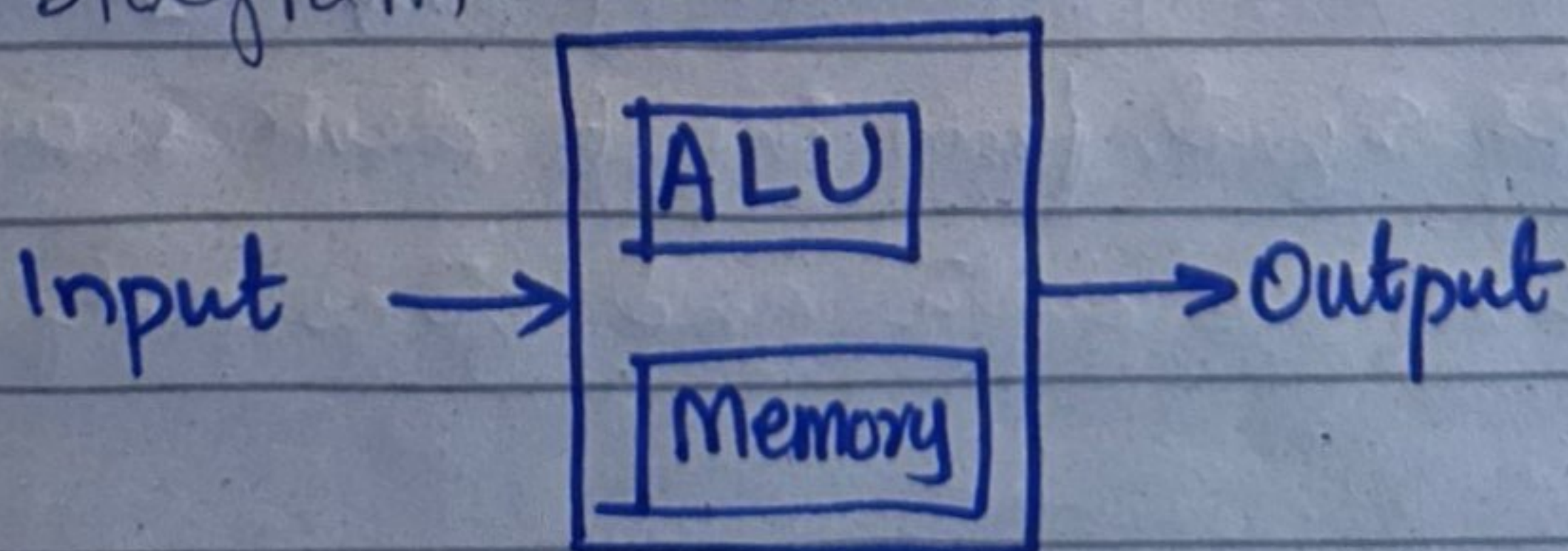
3. Just like a place without electricity is not liked similarly a time will come where smart homes where AI controls everything will become the new norm.

4. Just like

b

CPU is considered the brains of the computer. It is compared with human brain in the following manner.

CPU Diagram





1. CPU has Arithmetic logic unit. This logic unit performs functions such as addition, multiplication, division and subtraction. Similarly human brain logically calculates events.
2. CPU has a memory storage. Humans have brain that stores memory.
3. The wires inside the CPU or to be precise on the motherboard are just like human brain neurons. They carry signals throughout the body.
4. Humans get data processes it and give output. For instance a person touches a hot pan. The sensory motor neurons carry signal to brain stating it was warm then brain gives output signal to move hand away. Similarly CPU does the same takes signal from input devices and process the data and gives output.



5. Without CPU the computer can not be turned on, similarly without brain human body can not function.

## C Balance Diet

A balance diet is when one consumes nutrients in their right quantity that is required by the body. These nutrients include protein, fats, carbohydrates, minerals, vitamins and water.

Balance diet is specific with respect to age, sex, height and weight of an individual.

## Deficiency of Vitamin A, B and C:

### Vitamin A

Deficiency can result in

- weak vision
- Unhealthy skin

### Vitamin B

B has many complexes and their



deficiency causes

- B-12 causes hair loss
- Bad skin

Vitamin C

Deficiency causes

- Scurvy

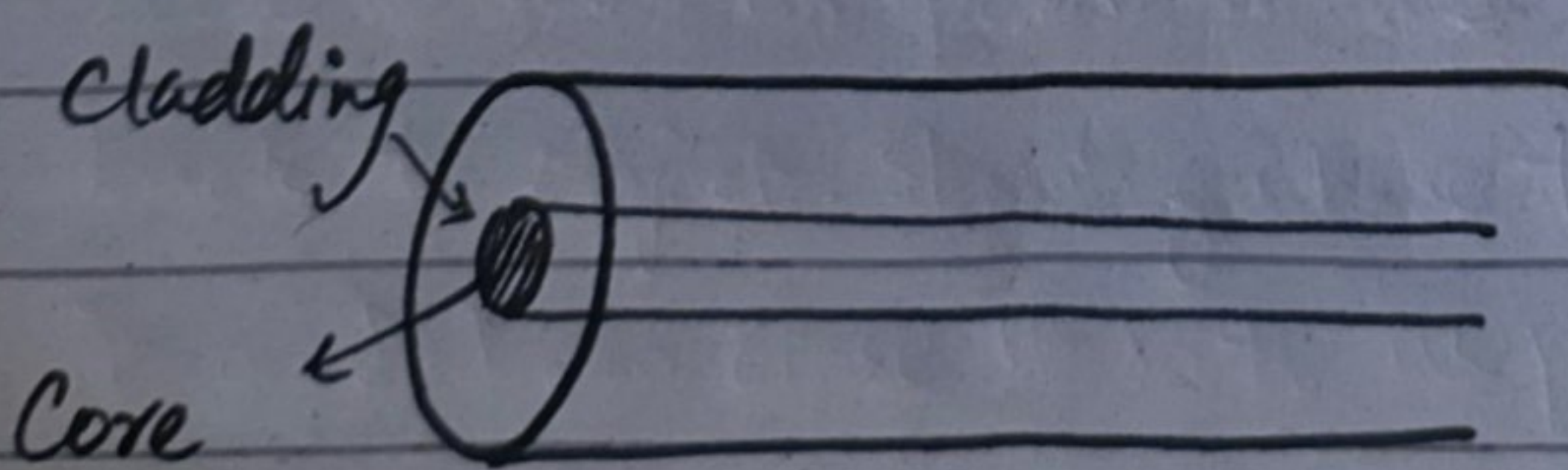
d

Optical fiber

Optical fibers are thin hair like glass or plastic wires that carry electrical signal at the speed of light.

The <sup>rate</sup> ~~speed~~ of data transfer depends on the width of optical fiber.

Diagram:

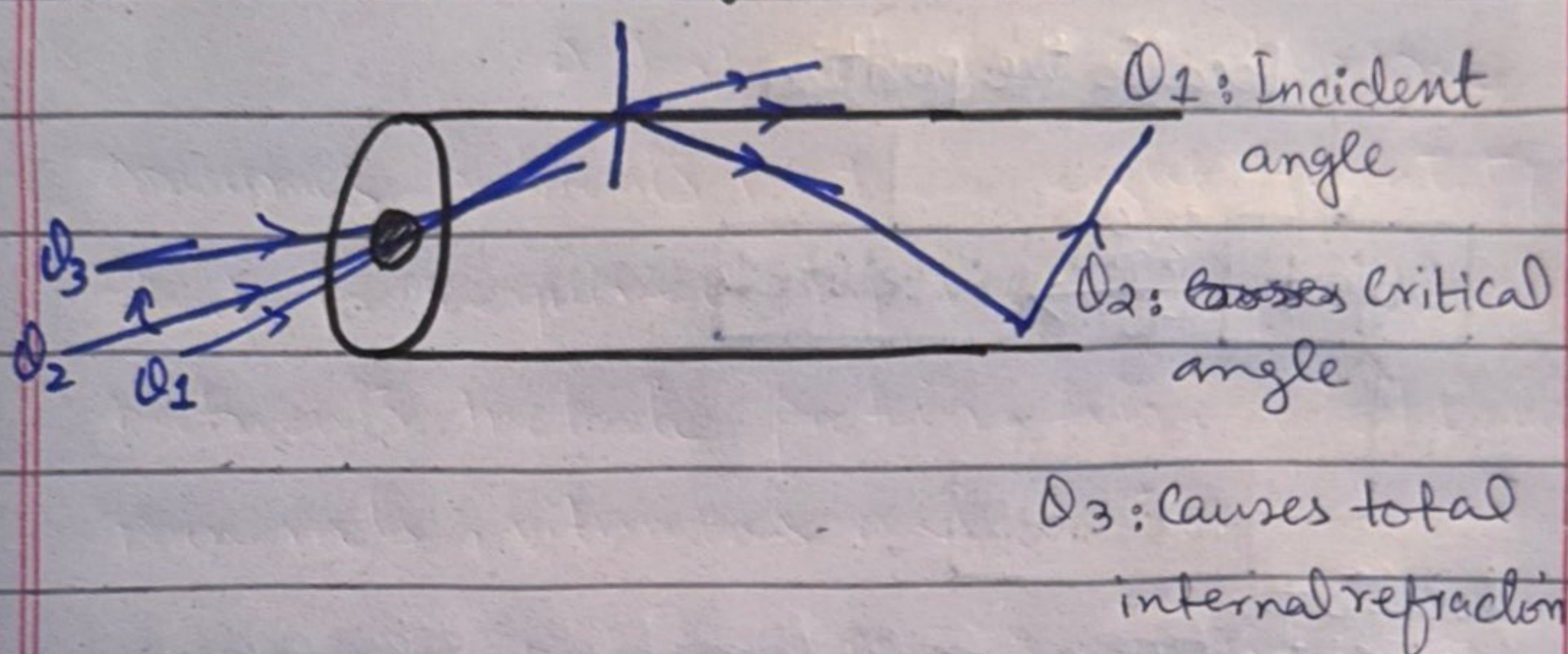




## Working of Optical Fiber

Core is highly dense and cladding is less dense. The <sup>light</sup> signals follows the concept of total internal reflection and so light bends.

## Total Internal Refraction

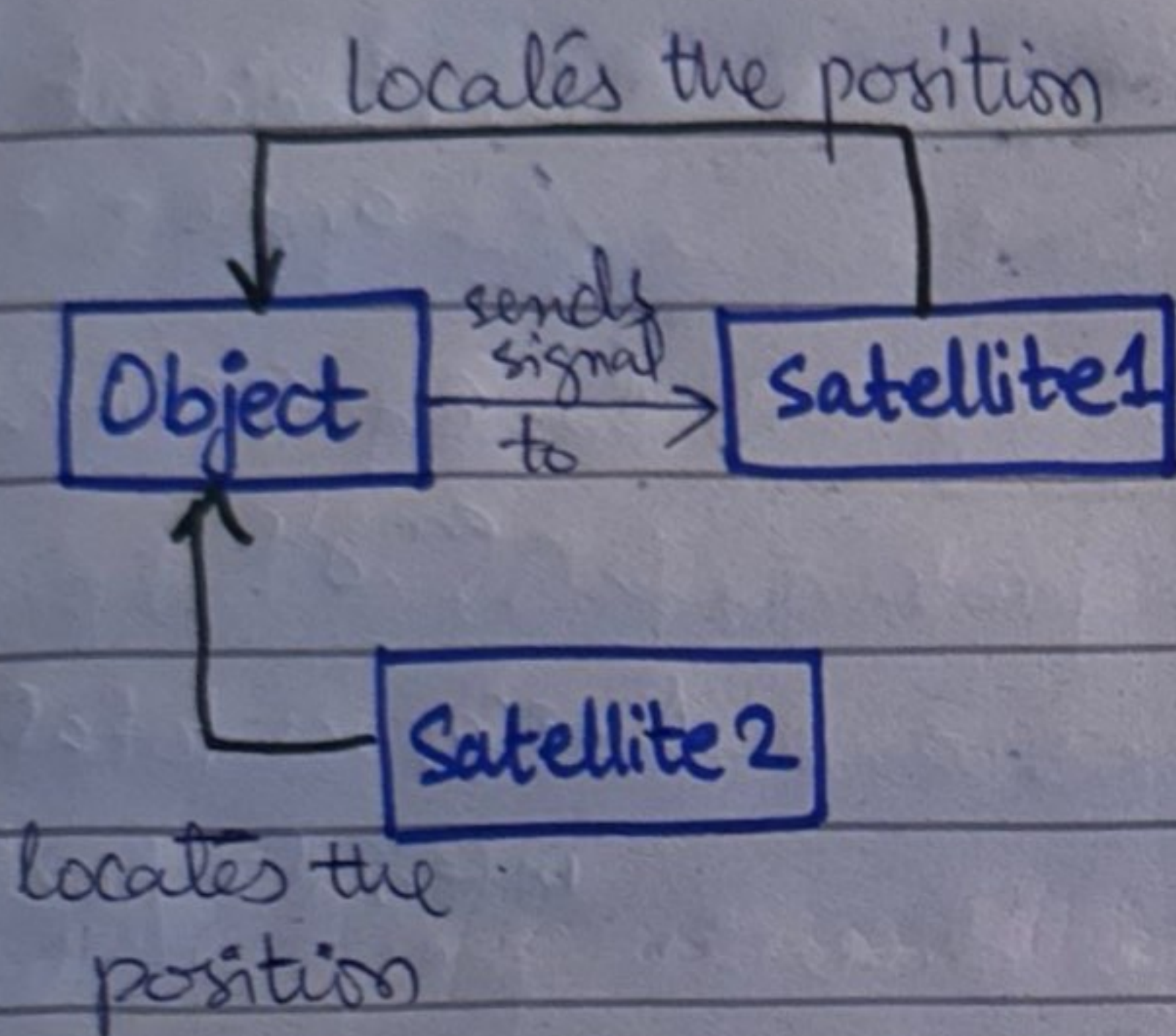


The dense core causes the light signal to bend. As the angle is increased, critical angle is reached. After further increasing the angle total internal reflection is caused which helps in transferring of signal. As core is dense the light ray keeps on bending and does not escape the optical fiber.



# GPS

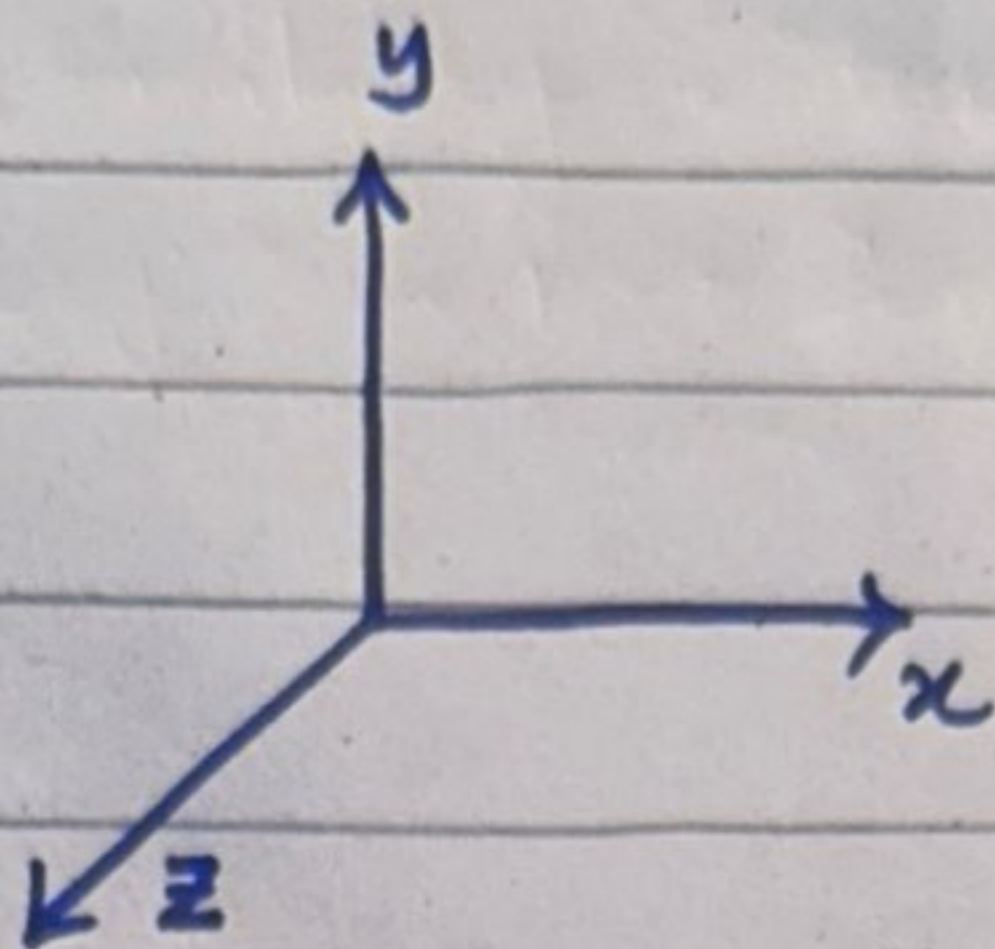
Geographical Positioning System. It is used to position locate the position of an object. There are around 24 GPS satellites in the atmosphere of Earth. The mechanism followed is as follows:



The object initial position is recorded by one satellite. Then it calculates its speed and direction and compare with its location (destination). Then if the object moves out of one locality the other satellite also locates its position and send signal back to object. Showing where the object is and how close it is to its path and also what path to follow.



## 2D and 3D location measure



Cartesian plane

For 2D data the satellite measures the  $x$  and  $y$  plane of the place. It give answer in 2 Dimensional plane.

In 3D the satellite see  $x$ ,  $y$ , and  $z$  plane. It gets signals from the place in 3 dimensions thus give 3D image.