

## Q3

(a)

Global warming is a wild beast because humanity is at risk of their survival. It is the result of man-made activity. The nature has set the composition of gases in the atmosphere, but with extensive industrialization and agriculture, human disturb the composition of gases in atmosphere. The result of this disturbing is seen in everywhere as glaciers are melting and temperature of earth increasing day by day. According to IPCC, the temperature increased from 1850 to 2022 is  $1.2^{\circ}\text{C}$  and it can be increased upto  $1.5^{\circ}$  or  $1.8^{\circ}\text{C}$  at the end of 2100.

### Impacts:-

1. Direct threat to life.
2. Melting of glaciers.
3. Rising global sea level
4. Direct threat to coastal life
5. Environmental refugees problems.
6. Extensive wild fires
7. Spread of diseases because no. of viral diseases and viruses because of glaciers melting

### Mitigation:-

Stabilizing the level of green house gases and it happened only when, there is transition from fossile fuel to renewable energy sources. Moreover, more planation is useful to control the world temperation. Other than this, decarbonization of transport is preferable for fast control on the



global warming. Town planning and population growth control measure are required on urgent based. If these measure are taken on immediate condition, there is a chance that human control global warming.

(C)

## Semi-conductors =

A material having electrical properties between insulator and conductor is known as semi-conductor.

Ex: Silicon, Germanium etc.

### Types

#### ① Intrinsic Semi-conductor =

A semi-conductor in its pure form is known as intrinsic semi-conductor.

Ex: Germanium and group IV element.

#### ② Extrinsic semi-conductor =

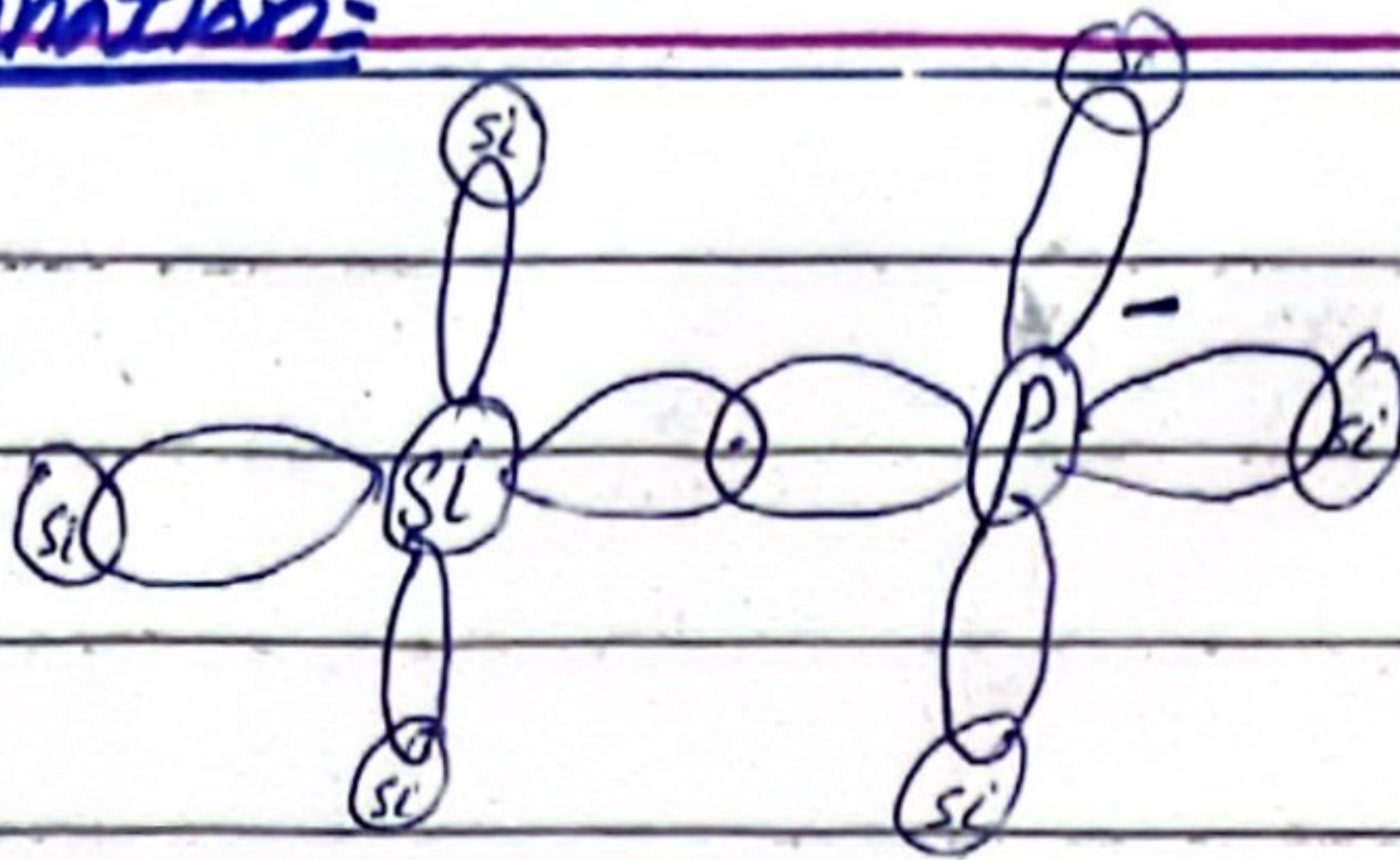
When impurity is added in pure semi-conductor it is known as extrinsic semi-conductor. It is further divided into two types:

##### ① N-type extrinsic semi-conductor =

When impurity added in pure semi conductor from V group of periodic table, then N-type extrinsic semi-conductor formed.



## Explanation:

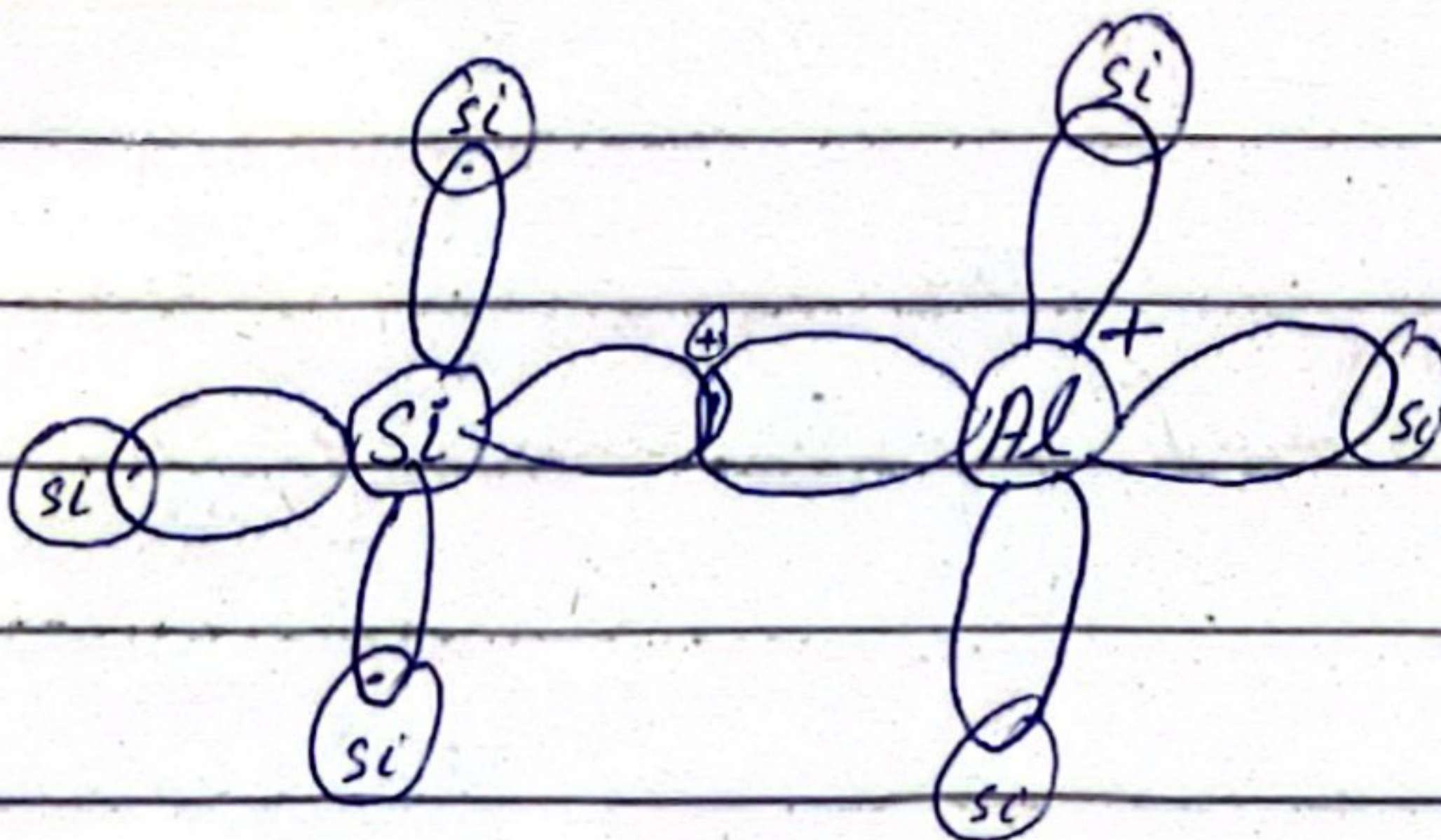


Phosphorus is the element which lies in V group of periodic table. It has five valence electrons in its outermost shell. When it is added in pure semi-conductor (Si), it share four of its valence electrons and one still remained in its valence shell. Because of it, a negative sign is put on phosphorus. It has still one electron left for sharing.

## P-Type Extrinsic Semiconductor:

When the impurity that is added in the pure semi-conductor comes from III group of periodic table, such semi-conductor is known as p-type extrinsic semi-conductor.

## Explanation:



Aluminium is III group member element and it has three valence electrons in its outermost shell.



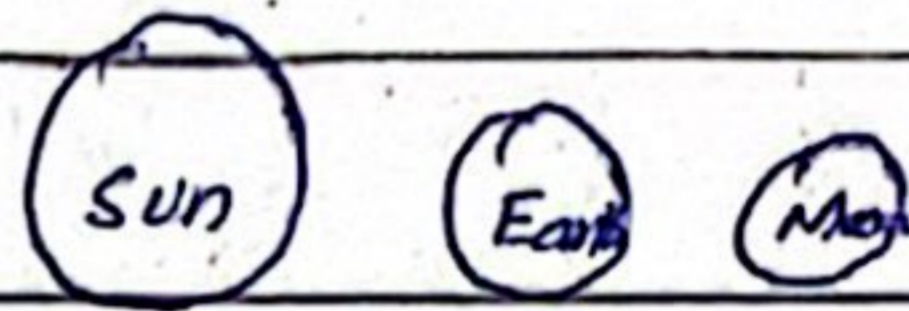
When it is added in pure-semiconductor like Si  
Then it has one hole left because of one electron  
deficiency. That's why, a positive (+) sign is put on Al.

(d)

## Eclipse

The obscuring of one astronomical object by another  
astronomical object is known as eclipse. It is  
divided in two types

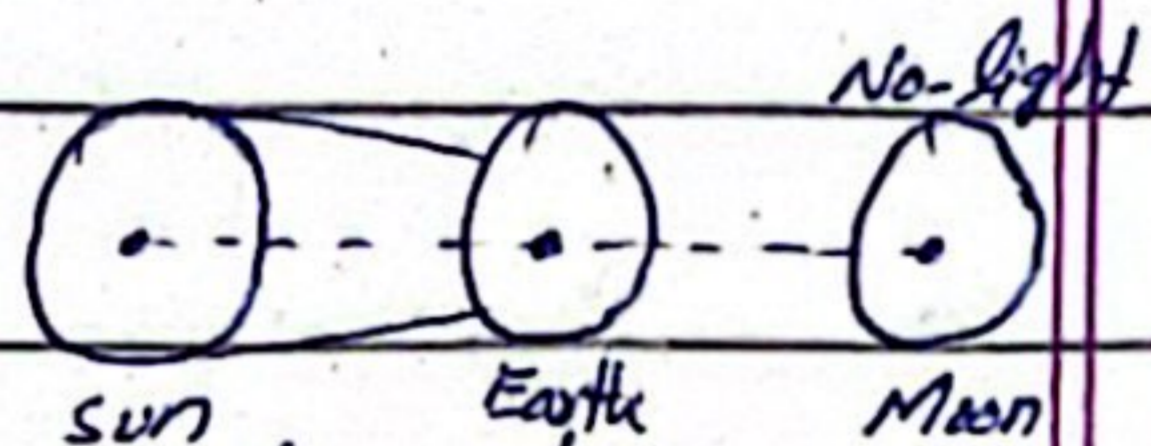
### 1. Lunar Eclipse



When Earth is in between the sun and moon  
then this eclipse is known as lunar eclipse.

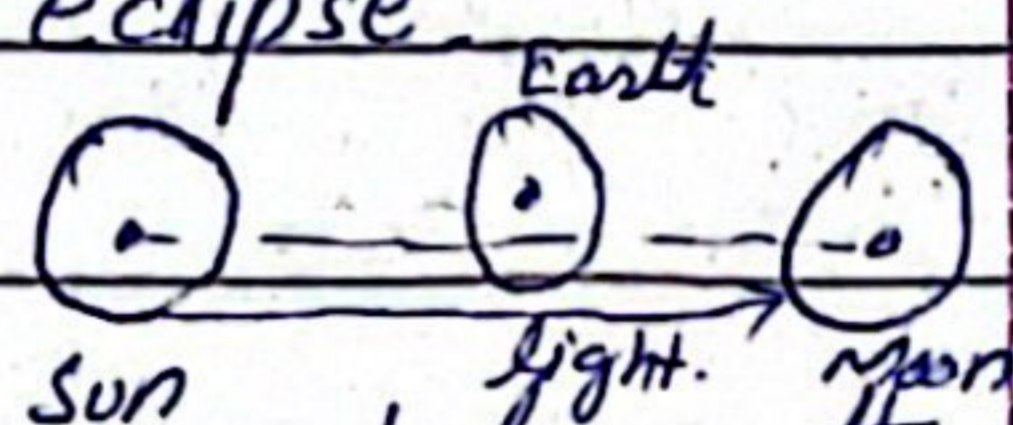
It is divided into two types:

#### (a) Total Lunar Eclipse



When Earth is exactly ~~right~~ aligned on the  
same line joining the center of sun and moon,  
this is called total lunar eclipse.

#### (b) Partial Lunar Eclipse



When Earth is slightly above or below the  
line that joining the center of sun and moon  
this is called partial lunar eclipse.

### 2. Solar Eclipse



When moon is in between the sun and earth  
then this eclipse is known as solar eclipse.

It is divided into three types:



### (a) Total Solar Eclipse:

When moon is exactly aligned on the same line joining the center of sun and earth, such eclipse is called total solar eclipse.

### (b) Partial Solar Eclipse:

When moon is slightly above or below the line that joining the center of sun and earth, such eclipse is called partial solar eclipse.

### (c) Annular Solar Eclipse:

The middle object moon is small in size than sun. When it is exactly on centre line then a sharp sun rays fall on the surface of earth because of moon small size which called belly beats. This is called annular solar eclipse.

(b)

### Origin of Universe =

The scientific explanation for the origin of the universe is the Big Bang theory. According to this theory, the universe is originated from an extremely hot and dense state approximately 10 to 20 billion years ago.

### Evidence =

Several Observations support this theory, including



the cosmic microwave background radiation,  
the abundance of light elements and large  
scale structure of universe.

## Method to Calculate the Age of Universe

1. By looking for the oldest stars.
2. By measuring the rate of expansion of the universe and extrapolation and extrapolating back to the ~~Back~~ Big Bang known as Hubble Constant.



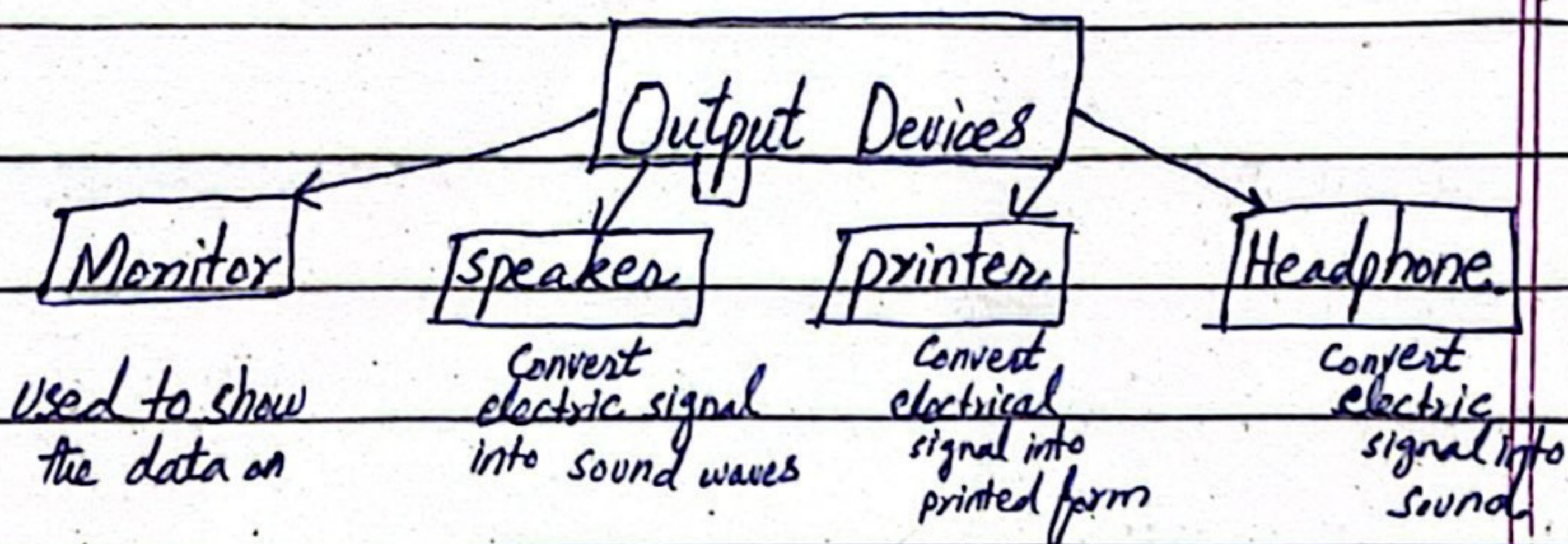
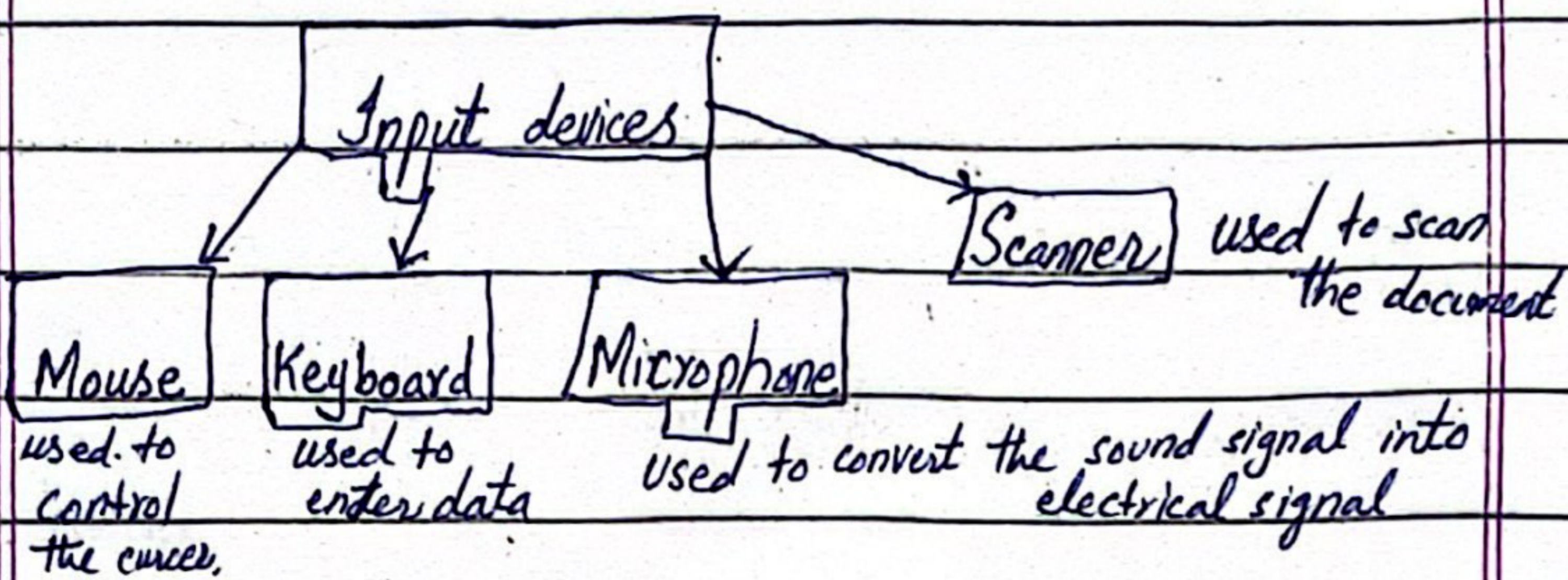
## Q5

### (a) Input Devices :

The devices that are used for giving instructions to the computer are called input devices.

### Output Devices:

The devices which are used to obtain the output from the computer are called output devices.



### (b)

## Optics

The study of properties and propagation of light is known as optics.

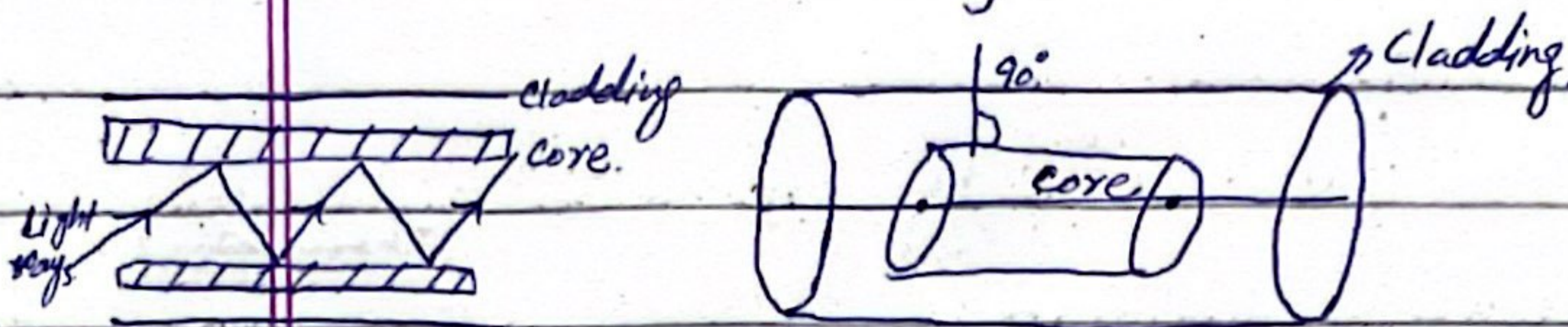
## Optical fiber

The strand of optical glass which is used to transmit light signals from one point to another point is called optical fiber. Its diameter is equal to the diameter of human hair.



## Working:

Optical fiber works on total internal reflection principle. It is divided into two part. The center part is known as core which has high density and other part is known as cladding that covers the core to stops the signal <sup>from</sup> spreading. Light rays contain information in it and it is decoded by other devices.



A light waves travelling inside a glass having critical angle, in which angle of incidence at which angle of refraction becomes equal to  $90^\circ$  its responsible to moves rays in forward directions. The phenomenon occurs at core-cladding boundary.

Types: These are:

- ① Single mode Index fiber  $\Rightarrow$  Core diameter  $5\mu\text{m}$
- ② Multi mode Index fiber  $\Rightarrow$  Core diameter  $10\mu\text{m}-50\mu\text{m}$ .
- ③ Multi mode graded index fiber  $\Rightarrow$  Core diameter  $4\text{mm}$ .

(c)

## Solid Waste Management

It is the supervised handling of waste from collection to disposal of solid and all types of waste.



## Different Methods

### 1. Open dumping:

It is the open decomposition of waste. It is detrimental technique because it become causes of many disease. Moreover, it is also responsible to environmental pollution. It is preferable where no school, hospital or other society institutions held. Also, it must be away from water bodies like canals.

### 2. Composting:

It is preferable for organic waste. Organic waste is composting and the product obtained is known as compostive which is useful in agriculture.

### 3. Incineration:

It is a process in which waste is incinerated in incinerator. It is useful for small institutional waste like hospital waste, school waste. Temperature required for this is high and between 100 to 200 °C. It is used for organic waste.

### 4. Land filling:

This technique is used in past. In this technique waste is buried in land and proper measures are taken to avoid the contamination of underground water.



(d)

## GPS

GPS stands for Global positioning system. It is an American based satellite system that is used in navigation purpose. In this system, 24 satellite which are revolving around the earth. It is used for 2D (Longitude plus Latitude) and 3D (Longitude + Latitude and Altitude). Only three geo-stationary satellites are useful for 3D location. It covers  $120^\circ$  of earth part. These satellite revolve around the earth twice a day and send signal to the earth. Time difference between sending of signal from satellite and receiving on earth tells about the distance. It is under US Airforce and US armies control.

## GIS =

GIS stands for Geographic Information system. This system is not just include software and hardware but all users are involved in it. It is a tool that creates, manages, gathers, analyses and maps all types of data. With the help of it, user can visualize different trends and monitor changes within an area. It is used for natural resource management by analysing, managing and monitoring natural hazards. It is just like remote



Q8

(a)

BROTHER is written as QDGI SNOA

SISTER is written as QDSR HR

(b)

Total cards = 12

Sample = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

(i)  $P(8) = \frac{P(\text{Probability of drawing 8})}{\text{Total}}$

$= \frac{1}{12}$

Total even numbers  
= 2, 4, 6, 8, 10, 12

(ii)  $P(\text{even number}) = \frac{P(\text{even number})}{\text{Total}}$

$= \frac{6}{12} = \frac{1}{2}$

(iii)  $P(\text{Perfect square}) = \frac{P(\text{Perfect square})}{\text{Total}}$

$= \frac{2}{12} = \frac{1}{6}$

Perfect square  
4, 9

(iv)  $P(\text{negative number}) = \frac{P(\text{negative number})}{\text{Total}} = \frac{0}{12}$

(v)  $P(13 > \text{number}) = \frac{P(\text{number less than 13})}{\text{Total}} = \frac{12-1}{12}$

(d)

Data = 15, 15, 16, 16, 16, 17, 17, 18, 19

Mean =  $\frac{15+15+16+16+16+17+17+18+19}{9} = 16.5$

Medium = 16

Mode = 16

Range = 19 - 15 = 4



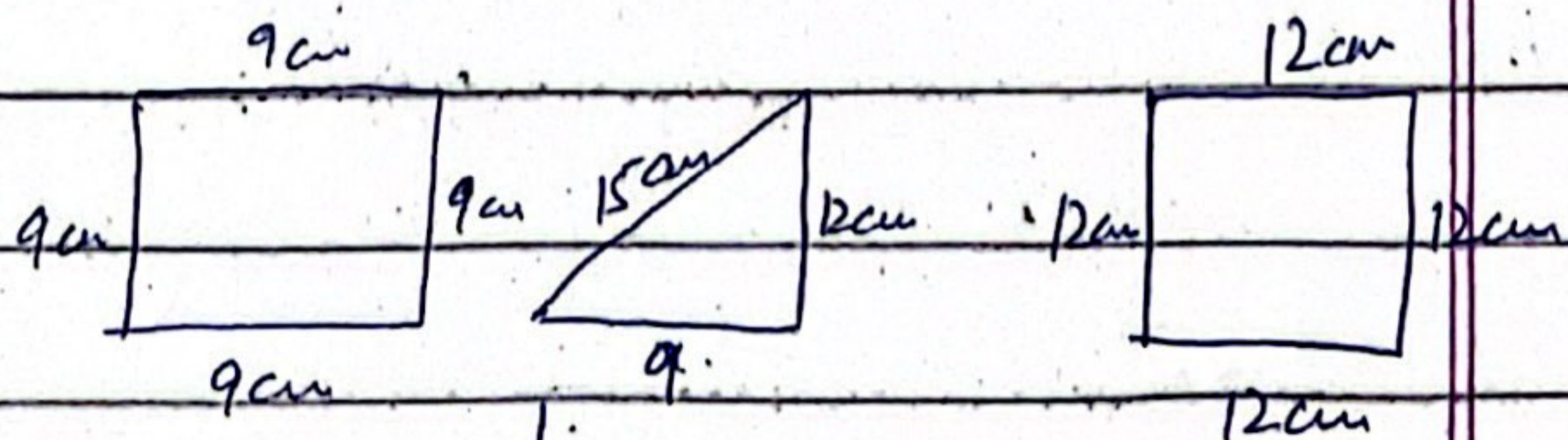
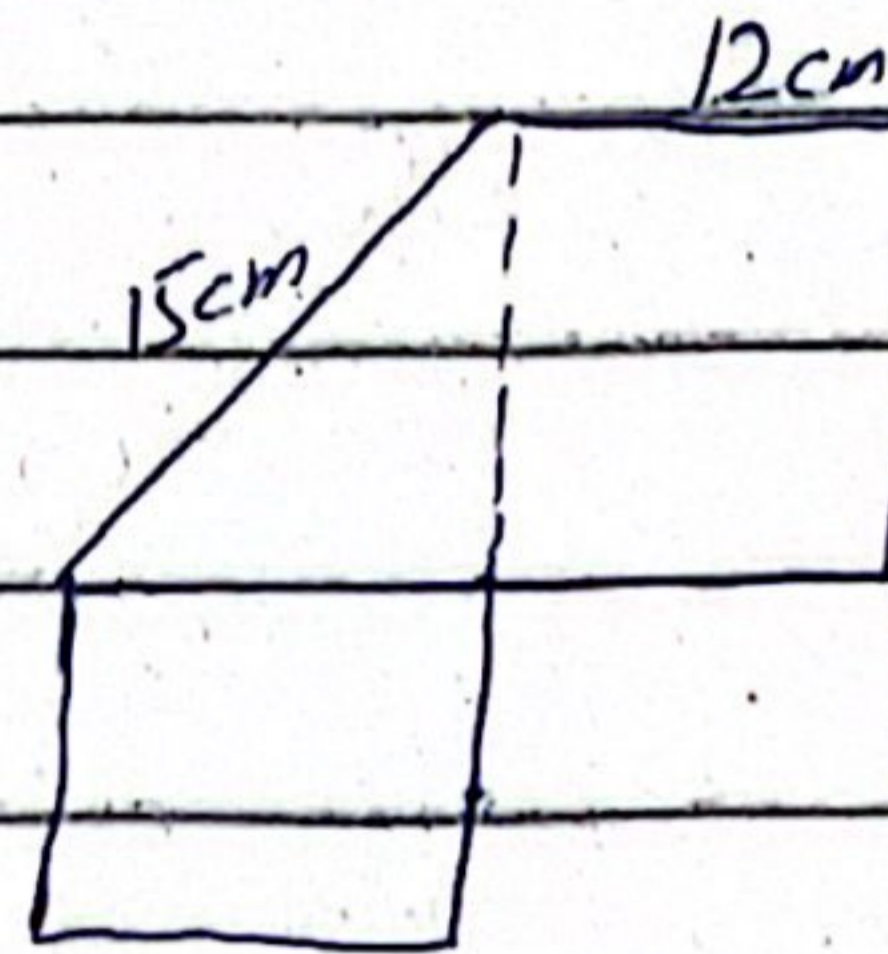
Mean = Mean is the average <sup>value</sup> of given data.  
It is obtained by dividing the sum of given data to total number.

Median = First given data is arranged in ascending order. Then the middle value is known as median.

Mode = The Most repeated value in given data is known as mode.

Range = The difference between highest value and smallest value in given data is known as range.

(c)



$$\begin{aligned} \text{Perimeter} &= 12\text{cm} + 12\text{cm} + 12\text{cm} \\ &+ 12\text{cm} + 15\text{cm} + 12\text{cm} \\ &+ 9\text{cm} + 9\text{cm} + 9\text{cm} \\ &+ 9\text{cm} + 9\text{cm} \end{aligned}$$

$$\text{Perimeter} = 120\text{cm}$$

$$\begin{aligned} H^2 &= B^2 + P^2 \\ (15)^2 &= x^2 + (12)^2 \\ 225 &= x^2 + 144 \\ x^2 &= 225 - 144 \\ x^2 &= 81 \\ x &= 9 \end{aligned}$$



$$\text{Area} = 12 \times 12 = 144 \text{ cm}^2$$

$$\text{Area} = 9 \times 9 = 81 \text{ cm}^2$$

$$\text{Total Area} = 279 \text{ cm}^2$$

$$\text{Area} = \frac{1}{2}(12 \times 9) = 54 \text{ cm}^2$$

Q7  
(d)

$$\text{Radius} = 10 \text{ cm}$$

$$\text{Height} = 36 \text{ cm}$$

$$\text{Volume} = ?$$

$$\text{Volume} = \pi r^2 h$$

$$\text{Volume} = (3.14) (10 \text{ cm})^2 (36 \text{ cm})$$

$$\text{Volume} = 11309 \text{ cm}^3 \quad \text{Ans.}$$

(b)

Persons

Sugar

Days

30 ↓

40 kg ↑

10 ↓

80 ↓

320 kg ↑

x ↓

The Relation between days and person are Inverse

The Relation between Sugar and days are direct.

$$\frac{x}{10} = \frac{320}{40} \times \frac{30}{80}$$

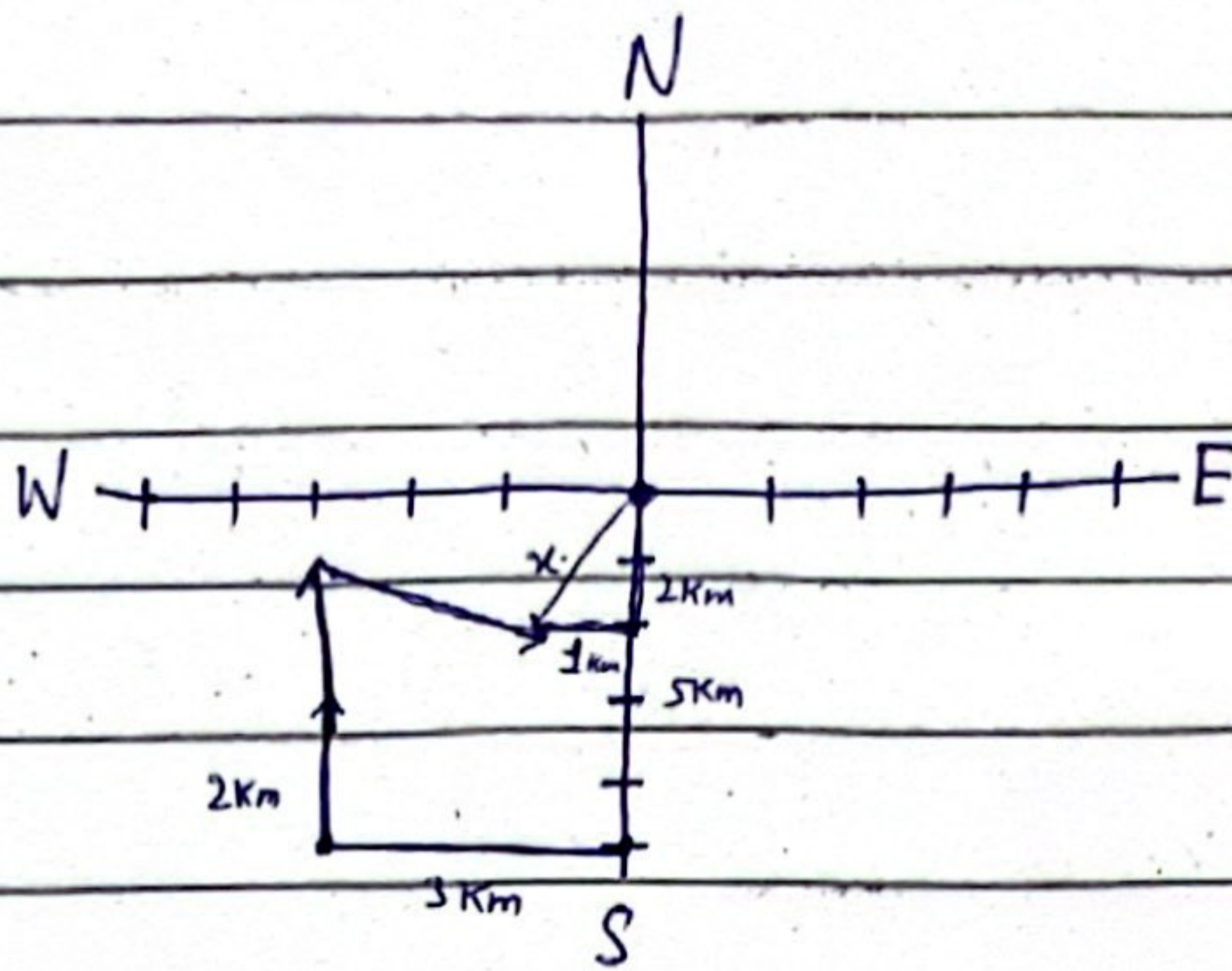
$$\frac{x}{10} = 3$$

$$x = 3 \times 10$$

$$\boxed{x = 30 \text{ Days}}$$



(C)



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

$$x^2 = 16 + 4 \Rightarrow x = \sqrt{20} \text{ km} \quad \boxed{x = 2.23 \text{ km}}$$

It is 2.23 km away from its initial point.

(a)

Total number of seats = 400

Number of occupied = 325

$$\text{Percent of capacity} = \frac{325}{400} \times 100\%$$

$$\boxed{= 81.25\%}$$

So, Percent of capacity is 81.25%.