

# SECTION-II

Date: \_\_\_\_\_

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## QUESTION NO: 03

### PART-A:

### ATOMS FORMING CHEMICAL BONDS:

Atoms form chemical bond to gain stability through the principle of "Octet Rule" which is defined as

"The tendency of electrons to gain eight electrons in the outermost shell"

Atoms satisfy this rule through:

- (i) Donation of electron in ionic bond
- (ii) Sharing of electron in covalent bond
- (iii) Attracting conducting electrons in metallic bonds.
- (iv) In hydrogen bonds.

Example:

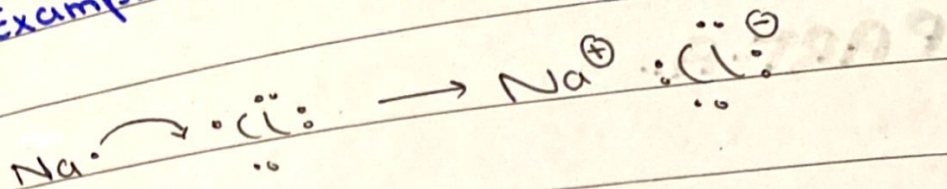


Figure: formation of ionic bond in NaCl

Na transfers electron and chlorine gains electron to satisfy octet rule.

## COVALENT BOND FORMATION IN A WATER MOLECULE:

Formation of covalent bond can be defined as

"Sharing of electrons among atoms in order to satisfy the octet rule."

Water molecule also contains covalent bond among 1 atom of oxygen and 2 atoms of hydrogen to satisfy octet rule

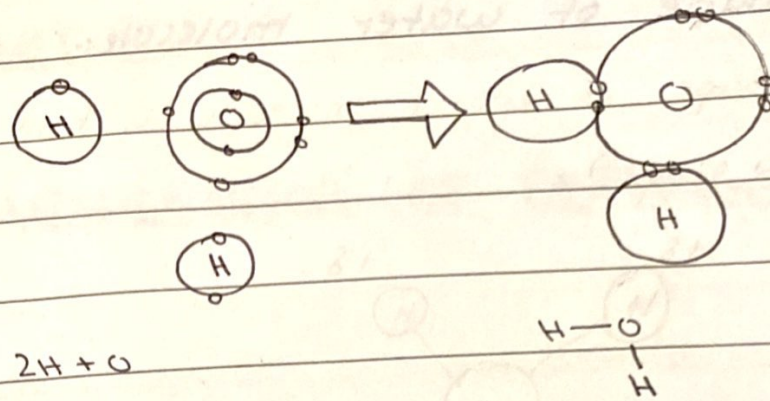


Figure: water molecule

Showing covalent bond

There are following characteristics present in covalent bond of water molecule:

(i) **Bond type of water molecule.**

Bond type of water molecule is polar covalent. As oxygen atom has high electronegativity so attracts ~~the~~ electron more towards itself. Oxygen atom acquires partial (- $\delta$ ) negative charge and hydrogen atom acquires (+ $\delta$ ) charge.

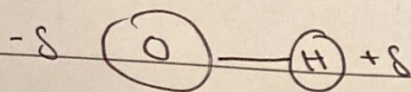


Figure: Polar covalent

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(ii) Shape of water  
Shape of water molecule is bent  
(V shape)

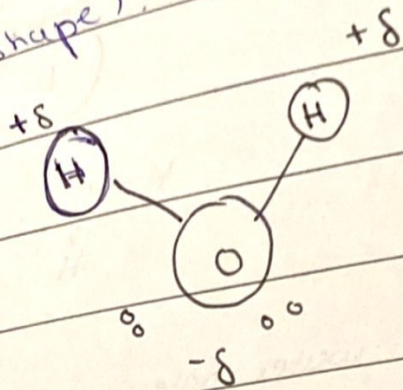


Figure: Bent shape of  $H_2O$

(iii) Hydrogen bond (Van der Waal forces):

Hydrogen bond or Van der Waal forces are present between hydrogen of water molecules &

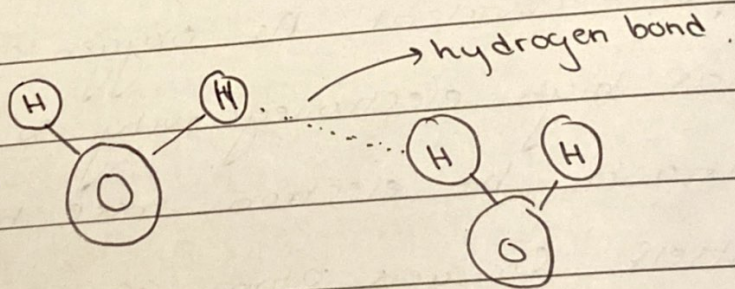


Figure: hydrogen bond in  $H_2O$  molecule.

## PART-B:

### PHENOMENA OF DOPING:

Doping process can be defined as:

" Adding some impurity atoms in a pure or intrinsic semiconductor to increase conductivity of a semi-conductor."

Doping can be done in two ways

(i) n-type or pentavalent dope

is added to an

intrinsic semi-

conductor

(ii) P-type or

trivalent

dopant atom

is added to

an intrinsic

semi-conductor

N-type  
doping

P-type  
doping

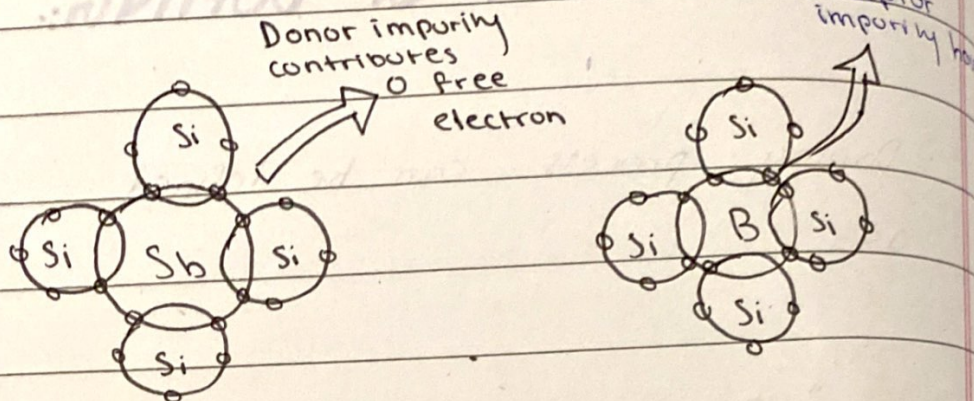


Figure: N and P-type dopants.

## DIFFERENT TYPES OF CERAMICS:

Different types of ceramics based on their application

	Application	Types	Properties	Eg
(i)	Glasses	Windows	noncrystalline silicates	Bottles
(ii)	Clay products	Structural products	Abundant Clay material	Roof tiles

(iii) Refractories high temp. capable of standing high temp. Furnace walls

(iv) Abrasive ceramics Hardness, wear resistance grinding, cutting of material Sand-paper

(v) Cement Slurry that sets and hardens Any shape can be formed mortar

(vi) Advanced ceramics Exploiting mechanical, electric properties Fine-tuned application heat engines

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PART (C):

# MERITS AND DEMERITS OF GLOBAL WARMING:

Global warming can be defined as

" Rise in temperature of earth's atmosphere due to entrapment of Green House Gases."

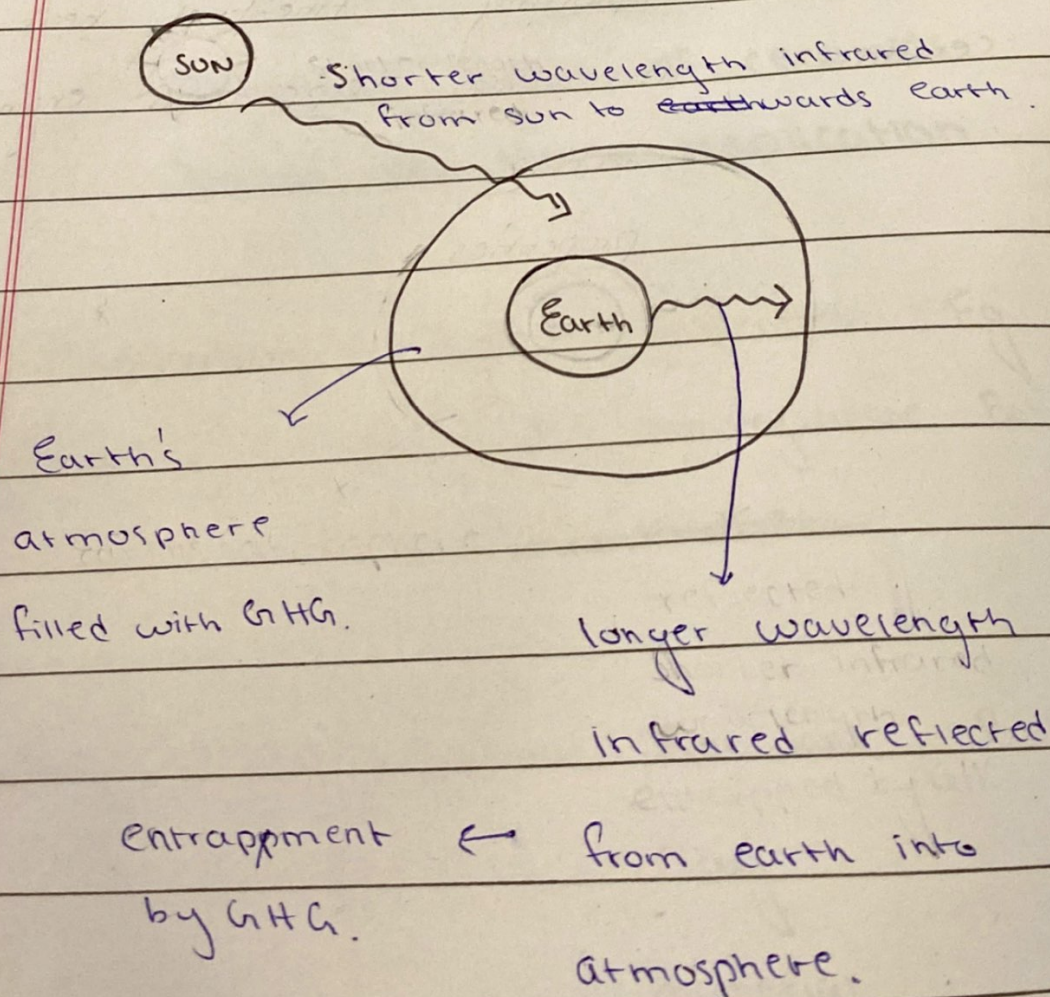


Figure 1: Phenomena of Global Warming



## MERITS OF GLOBAL WARMING:

### (i) Maintaining the earth's temperature:

Global warming involves entrapment of heat by Green House Gases (GHG). Subsequently, it maintains temperature of earth's atmosphere conducive for living.

### (ii) Growth of plants in frozen region:

Global warming helps growth of plants in frozen regime regions of Arctic and Antarctica.

### (iii) Milder climate in frozen region:

Global warming helps to create milder climate for habitation in Siberia, Arctic, Antarctica.

### (iv) For Availability of gas and oil reserves:

Formerly untapped oil and gas reserves can be made available.

## DEMERITS OF GLOBAL WARMING

### (i) Rise in temperature of Earth's atmosphere:

Global warming is causing rise in temperature of the earth's atmosphere and ~~is~~ presenting adverse effect on living conditions.

### (ii) Increase in natural disaster:

Global warming cause melting of polar ice caps and increase in Glacial Lake Outburst Floods, droughts and change in precipitation pattern.

### (iii) Loss of species:

Global warming is causing extinction of species due to rise in temperature.

### (iv) Loss of coastal land:

Rise in sea level is causing

incurion of seawater on land  
and subsequently loss of coastal  
land.

## PART: D

### THE DISEASE OF POLIO:

Poliomyelitis can be defined as:

"Inability to move or  
muscle weakening of  
limbs due to the affect of  
polio virus on central  
nervous system."

#### (i) Cause of disease:

It is a polio virus which  
is contagious and caused by  
"Picornoviridae"

**(ii) Mode of transmission:**

Feco-oral route, spreading by food or water contamination and to lesser extent contaminated saliva.

**(iii) Symptoms of polio:**

Symptoms of polio includes:

- (a) Headache, fever, vomiting
- (b) Abnormal reflexes
- (c) Back pain
- (d) Muscle spasm.

## **CHALLENGES IN ERADICATION OF POLIO IN PAKISTAN:**

**(i) Resistance to vaccination:**

Parents are not inclined towards getting their children vaccination of polio.

**(ii) Contamination of water**

Supply:

Poor life style including contamination of sewerage water accelerates spread through feco oral route

(iii) Harsh climate areas access is difficult:

Access in some areas with harsh climate and geographical terrain is difficult.

It provides hinderance in vaccine administration by polio workers

(iv) Insecurity of the polio workers:

Polio workers administrating vaccine are subject to extremism and faces issue of insecurity.

(v) Ineffectiveness of health care system:

Ineffective reforms presented by health care system, and lack of governance

# QUESTION NO: 04

## PART (A):

### LIVER JUICE KNOWN AS BILE:

Bile can be defined as

"An aqueous solution secreted by liver for the digestion of lipids."

#### (i) Secretion and storage of bile:

Bile is secreted by the hepatocytes of liver and stored in gall bladder.

#### (ii) Composition of bile:

Composed of:

(a) 95% water

(b) 0.7% bilirubin salts

(c) 0.2% bilirubin

(d) 0.51% fats

### (iv) Functions of bile:

Functions of bile are:

- (a) emulsification of fats
- (b) elimination of cholesterol
- (c) excretory route of bilirubin
- (d) digestion of cholesterol, vitamins

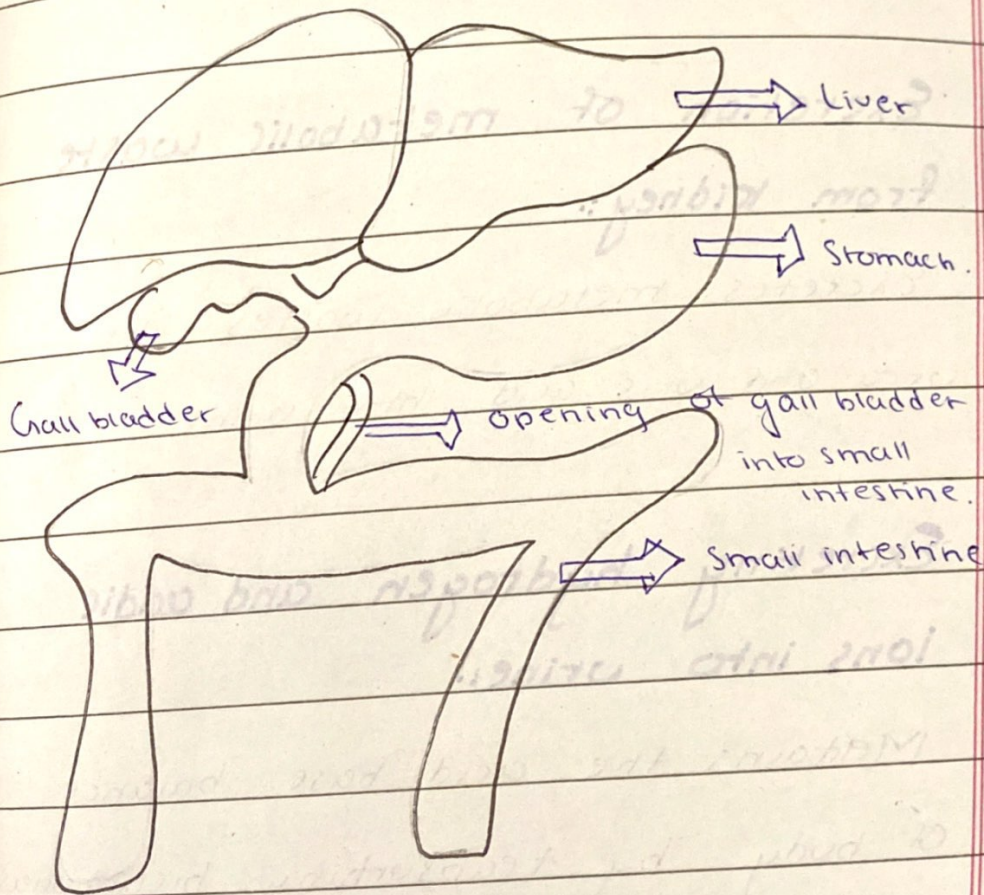


Figure: Gall bladder storing

bile from liver, and

secreting into small

intestine.

## PART B:

# THE ROLE OF KIDNEY IN EXCRETION:

Following is the role of kidney in excretion:

### (i) Excretion of metabolic waste from kidney:

Excretes metabolic wastes like urea and uric acid into urine.

### (ii) Excreting hydrogen and acidic ions into urine:

Maintains the acid base balance of body by reabsorbing bicarbonate from urine and excreting hydrogen ions and acidic ions into urine.

### (iii) Excretion of excess fluid from body:

Kidney secretes excretes excess fluid from body during urine.



## (iv) Secretion of hormones:

Secretes hormones that help in acid regulation:

(a) Erythropoietin: In response to hypoxia.

(b) Renin: Controls blood pressure.

(c) Calcitriol: Absorption of calcium in intestine.

## (v) Controlled excretion of ions, water and other substances for homeostasis:

Kidney maintain homeostasis through controlled excretion of ions and water substance.

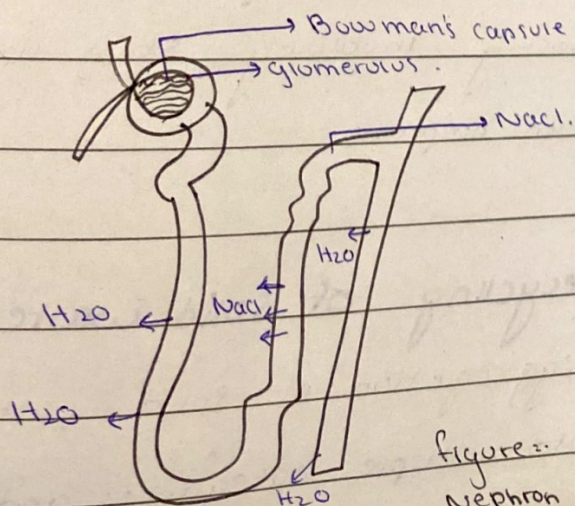


Figure:  
Nephron excreting  
absorbing molecules

## PART C:

### DIFFERENT TYPES OF SOLID WASTE MANAGEMENT:

Solid waste management can be defined as

" Proper collection, segregation and disposal of solid waste through various methods."

Following are the different types of solid waste management:

#### (i) Incineration of solid waste:

Hazardous solid material is burned at a high temperature.

Mostly involving solid waste from hospitals.

#### (ii) Recycling of solid waste:

Segregation of solid waste into multiple categories and

recycling through conversion of waste material into new products

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(iii) **Land fill disposal of solid waste.**

Land fill is a pit or mound of earth where solid layout is buried.

(iv) **Composting of solid waste products.**

Aerobic method of decomposing organic solid waste for recycling of organic & material.

## **PART: D**

(i) **ANEMIA:**

Anemia can be defined as

" Decrease in total amount of Red Blood Cells (RBC)

either through excessive loss or increased

destruction of RBC."

## (ii) APPENDICITIS:

Appendicitis can be defined as

"Inflammation of appendix

due to viral or bacterial

infection or tumour

## (iii) SPLEEN:

Spleen can be defined as

"An organ of the circulatory

system which is involved

in the regulation of  
Red Blood Cells (RBC)."

## (iv) MYOPIA:

Myopia can be defined as,

"Near-sightedness where

light from distant objects

focuses in front of retina,

as a result distant  
objects seem blurry

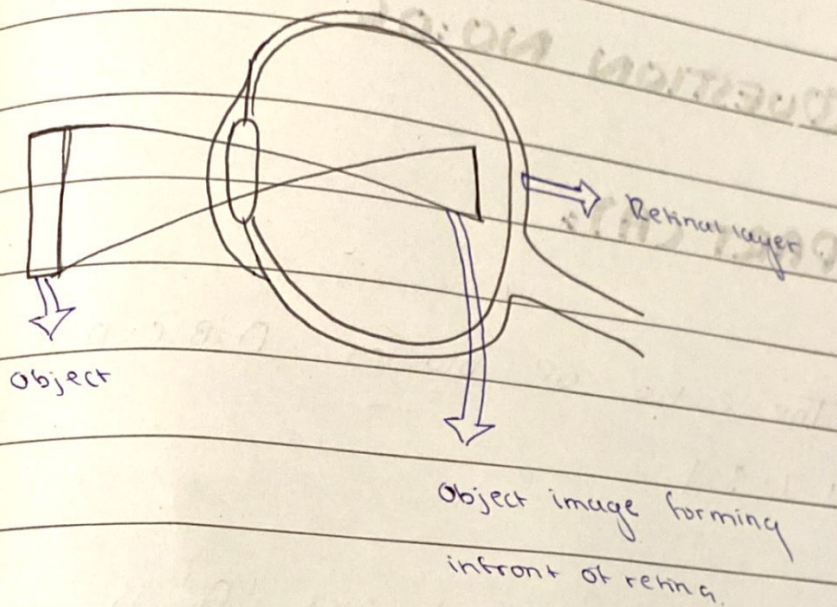


Figure:- Myopia (~~is~~ short-sightedness)

## (1) ISOTONES:

"Isotones are nucleides of different chemical element, with same neutron number but different proton number."

### Example:

Oxygen  ${}^{16}_{8}\text{O}$  ( $p=8, n=8$ )

Nitrogen  ${}^{15}_{7}\text{N}$  ( $p=7, n=8$ )

Carbon  ${}^{14}_{6}\text{C}$  ( $p=6, n=8$ )

## SECTION-II

### QUESTION NO:06

#### PART (A):

The ratio of blocks A:B:C:D is  
 $4:7:3:1$

The number of blocks 'A' is  
50 more than the (C) blocks.

Let the number of blocks

A, B, C, D be  $4x:7x:3x:x$ .

According to equation of  
scenario:

The number of A blocks - number  
of C blocks = 50.

$$4x - 3x = 50.$$

$$x = 50.$$

Substituting the value of  $x$  to  
Find value of  $B$ .

$$\text{Number of B blocks} = 7x$$

$$= 7 \times 50$$

$$= 350$$

Hence, the number of B blocks  
in the given scenario ~~are~~ <sup>is</sup> 350.

**PART (B):**

The original cost of pair of  
Shoes is = 80

Discount on pairs of shoes = 15%

$$= \frac{15}{100}$$

$$= \frac{3}{20} \times 80$$

$$= 12$$

$$\text{Discounted price} = 80 - 12 = 68$$

Sales tax applied = 10%

= 16

100

$$= \frac{1}{10} \times 169$$

= 6.8

Price after application of sales tax = 74.8

**PART (C):**

Travelling <sup>distance</sup> speed of train = 42 km.

Speed of train is = 36 km/hr.

Departure time of train = 4 pm.

Arrival time of train = 3 ?

Using the formula of speed

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



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

Putting the values of distance  
and speed in above formula:

$$= \frac{42 \text{ km}}{36 \text{ km/hr}}$$

$$\text{time} = 1 \frac{1}{6} \text{ hr.}$$

Time taken by train is  $1 \frac{1}{6}$  hours.

therefore train will arrive

around 5:20 pm.

## PART (D)

(i) Superintendent.

(ii) White.

## QUESTION NO: 08

## PART-A:

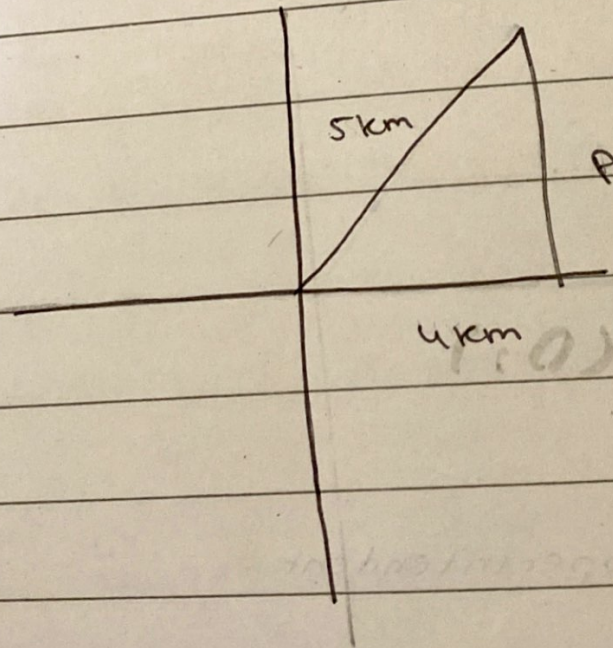
A man travels a path of right angle triangle in the following way.

Travelling along base = 4 km

Travelling along hypotenuse = 5 km

Continuation in same direction = 5 km

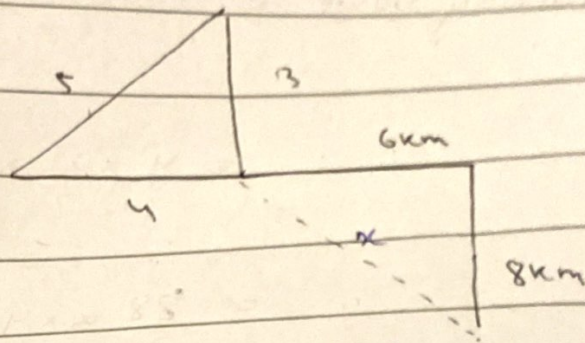
Travel after turning  $90^\circ = 8$  km



$$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Height}^2$$

$$\text{Height}^2 = \text{Hypotenuse}^2 - \text{Base}^2$$

$$\begin{aligned} \sqrt{H^2} &= \sqrt{Hypo^2 - Base^2} \\ &= \sqrt{5^2 - 4^2} \\ &= \sqrt{25 - 16} \\ &= \sqrt{9} \\ &= 3 \text{ (Height)} \end{aligned}$$



Using the formula

$$H^2 = B^2 + P^2$$

$$x^2 = 6^2 + 8^2$$

$$\sqrt{x^2} = \sqrt{6^2 + 8^2}$$

$$x = \sqrt{36 + 64}$$

$$= \sqrt{100} = 10 \text{ km}$$

$$\text{Total distance} = 3 + 5 + 4 + 6 + 8 = 26 \text{ km}$$

He has travelled around 26 km

and is 10 km away from starting point

**PART (C):**

Radius of sphere = 7m.

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

Putting value of radius.

$$= \frac{4}{3} \times \frac{22}{7} \times (7)^3$$

$$= \frac{88}{3} \times 49$$

$$= 1437.3 \text{ m}^3$$

Area of sphere =  $4 \times \pi \times r^2$ .

$$= 4 \times \frac{22}{7} \times (7)^2$$

$$= 616 \text{ m}^2$$

Therefore, volume of sphere is

1437.3 m<sup>3</sup> and area is 616 m<sup>2</sup>.



$$\text{Aslam} = 3x$$

$$= 3(360)$$

$$= 1080 \text{ rupees}$$

$$\text{Ashraf} = 7x$$

$$= 7(360)$$

$$= 2520 \text{ rupees}$$

Hence the distribution of money should be in such a way

that Zain gets 720 rupees

Aslam 1080 and Ashraf 2520 rupees.