General Science and Ability

Section - II B

Question no. 6

(a)

Data Given:

Sum of 3-digit number = 15

and,

Sum of 10^{th} and unit digit = 12

and,

difference of unit digit from 10^{th} digit = 2

To Find:

Three digit number = ?

Solution:

Let, the 3-digit numbers are H, T, U

So,

$\therefore$ 10^{th} digit = T, Unit digit = U

From the given data;

$$T + U = 12 \quad \text{——} ①$$

Similarly,

$$T - U = 2 \quad \text{——} ②$$

So, If we add eq ① and ② the we can find the value of T and U.

$$T + U = 12$$
$$T - U = 2$$
$$\overline{2T = 14}$$
$$T = \frac{14}{2}^{7}$$
$$\boxed{T = 7}$$

Now, If we put the value of T in eq ①, then;

$$7 + U = 12$$
$$U = 12 - 7$$
$$\boxed{U = 5}$$

We need to find the three digit number whose sum is 15. So, we can

write it as follow;

(Hundr.) (Tenth) (Unit)

$H + T + U = 15$

Adding the value of T and U, to find the value of H.

$H + 7 + 5 = 15$

$H + 12 = 15$

$H = 15 - 12$

$\boxed{H = 3}$

So, now we have got the three digit number whose sum is 15.

$\boxed{\text{Three digit number} = 375}$ Ans.

—(C)—

Data Given:

Daimeter of a circle = 6 cm

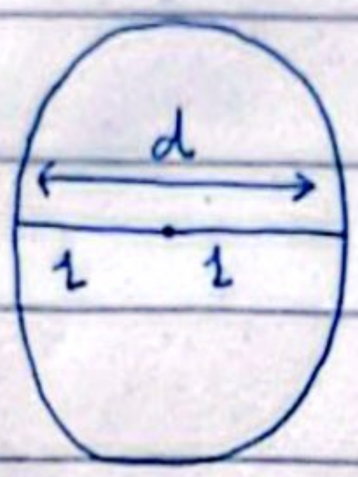
To find:

Circumference of a circle = ?

Area of circle = ?

Solution:

Daimeter of a circle = d = 6 cm



- Therefore $d = 2r$

So, from that we can deduce that

$$r = \frac{d}{2}$$

$$r = \frac{6}{2}\,3$$

$$\boxed{r = 3 \text{ cm}}$$

Now, To find Area of circle, we need to apply formula;

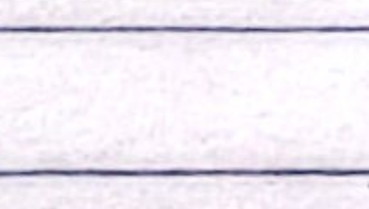
$$\text{Area of circle} = \pi r^2$$

$$\text{Area of circle} = 3.14 \times (3) \times (3)$$

$$= 3.14 \times 9$$

$$= 28.26 \text{ cm}^2$$

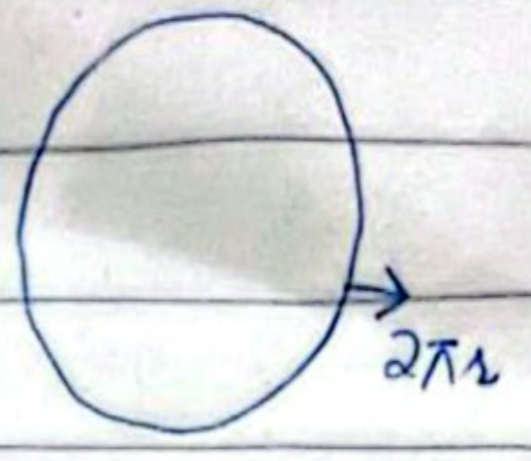
$$\boxed{\text{Area of cir.} = 28.26 \text{ cm}^2}$$



Area covered by the circle

Similarly, to find out circumference of the circle we need to apply the follow-

ing formula;



Circumference of circle $= 2\pi r$

$= 2 \times 3.14 \times 3$

$= 6 \times 3.14$

Circumference = 18.84 cm.

Hence, Area of circle is $28.26 cm^2$ and circumference of circle is 18.84 cm.

—(d)—

(i). 13, 24, 46, 90, 178, ___

$(6 \times 2) + 1 = 13$	13
$12 \times 2 = 24$	24
$(24 \times 2) \div 2 = 46$	46
$(45 \times 2) = 90$	90
$(89 \times 2) = 178$	178
$177 \times 2 =$	?

misdued

(ii). 5, 6, 9, 14, 21, ___

5	5
5 + 1 = 6	6
6 + 3 = 9	9
9 + 5 = 14	14
14 + 7 = 21	21
21 + 9 = 30	?

The above series starts from number 5 and then keep adding odd numbers starting from 1 and then all the way up to number 9. Therefore the missing number in the series is 30.

— (b) —

Data Given :

Small, Medium and large pizzas are ordered for 18 persons.

∴ 1 slice / person

and,

Ratio of their slices = 2 : 3 : 4

and, all contains different number of slices.

Moreover,

each slice is = 40 gm

and,

Price of smaller pizza = 320 rupees.

To find:

Price of total Pizza = ?

Weight of total pizza = ?

Solution:

Ratio their slices are as follows;

S	M	L
2	3	4

To find out the number of slices of small Pizza (S).

$$(S).\ Slices = \frac{S(ratio)}{sum\ of\ ratio} \times Total\ persons.$$

$$= \frac{2}{2+3+4} \times 18$$

$$= \frac{2}{9} \times 18\ 2$$

$$\boxed{S = 4}$$ number of slices.

Similarly,

M's slices = $\frac{3}{9} \times 18$?

(Pizza) → Medium = [6] number of slices

Lastly,

L's slices = $\frac{4}{9} \times 18$?

= [8] number of slices

If the weight of each slices is 40 gm, then we can multiply 40 gm with total number of slices.

Total. Numbers of slices = Small + Medium + Large

= 4 + 6 + 8 => [18]

Therefore, weight of total pizza;

Total weight = 40gm x 18.

Total weight = [720gm] Ans.

Since, small pizza has 4 slices, and the price of one small pizza is 320 rupees.

Therefore, we need to find price of each slice,

$$\text{Price of each slice} = \frac{320}{4}^{80}$$

Price of each slice = 80 rupees

Total slices of pizza are 18, therefore total price of pizza can be as follows;

$$\text{Total price} = \text{Price of one slice} \times \text{Total number of slice}$$

$$= 80 \times 18$$

$$\boxed{\text{Total price} = 1440 \text{ rupees}} \quad \text{Ans.}$$

Question no. 8

—— (a) ——

Data Given :

Length of a classroom = 15 ft

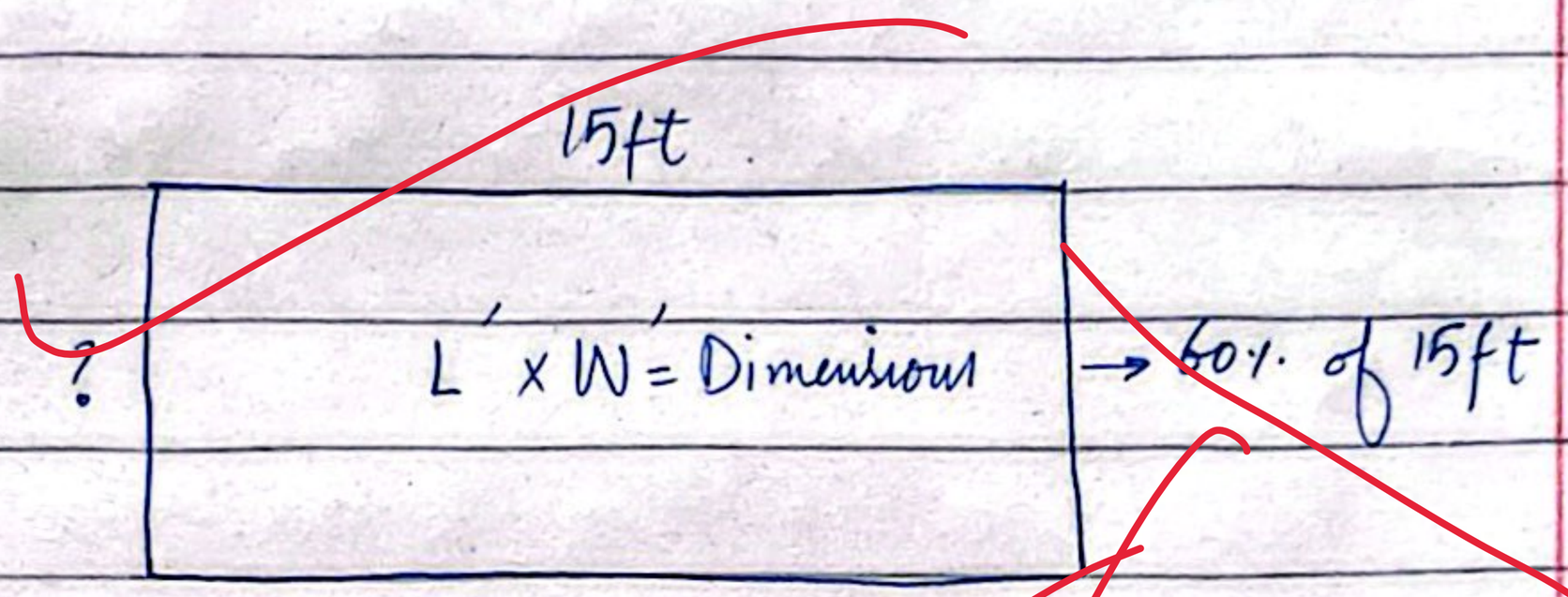
and, Width of rectangular room is 60% of its length.

To find:

Room dimension = ?

Solution:

Length of a room = 15 ft



Moreover, width of room is 60% of the length; therefore

60% of 15ft = ? ∴ $\frac{60}{100} \times 15$

60% × 15ft = 9ft ∴ 9 ft

Now, the width of the room is 9ft.

~~Hence~~ The dimensions of the rectangular room are as follows;

Dimensions of rectangular room = 15ft by 9ft

or = 15' x 9' Ans.

Data Given:

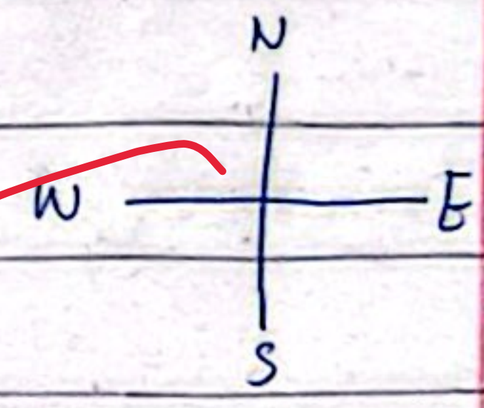
Veena ran east = 48ft

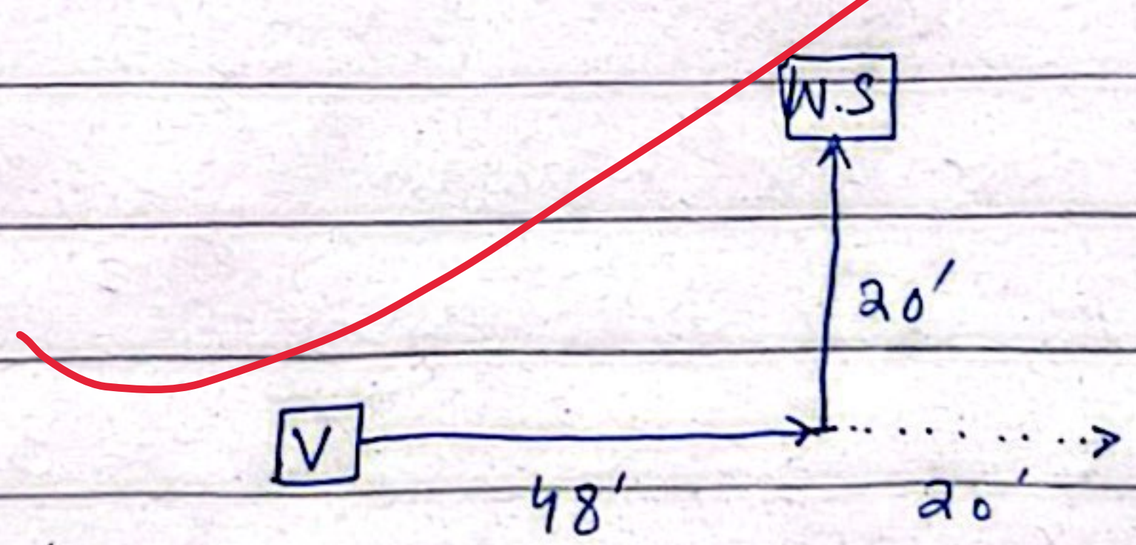
" " north = 20ft

To find:

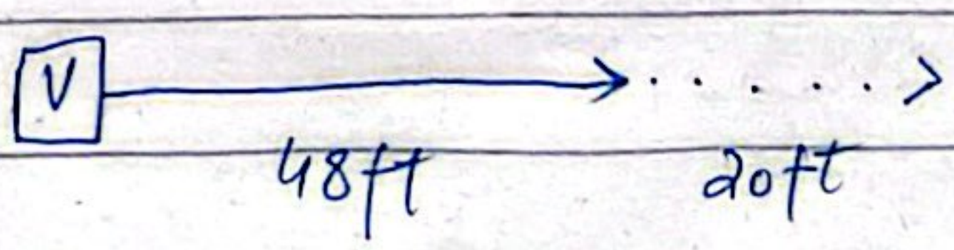
If she would have run straight there from where she started, how far would she had run = ?

Solution:





Veena ran 48ft east and then turned to north to ran 20ft more, But, if she ran straight from where she had started then she would have covered the following distance.



Therefore, If we add 48ft and 20ft because she would have been swimming in the straight line, then she would have been 68ft away from the starting point.

Distance from starting point = 48ft + 20ft

[Total distance = 68ft]

-(d)-

Data Given:

People who like Vegetable Pizza = 37

" " " Chicken " = 25

People who like neither = 3

To find:

Probability that a person likes a chicken pizza of choosen randomly = ?

Solution :

Total number / Sample size / Population
= 37 (Vegetable lovers) + 25
(Chicken lovers) + 3 (neither)

Total. = 65

So, if a person choosen randomly, we need to find a probability that he is a chicken lover.

Therefore, when we apply the formula of probability, following are the results :

$$P = \frac{P(E) \text{ event}}{\text{Total possible outcome}}$$

$$P(\text{Person likes a chicken pizza}) = \frac{\text{People who like chicken}}{\text{Total number}}$$

$$= \frac{5}{65}$$

$$= \frac{13}{25}$$

$P(\text{Person like Chicken Pizza}) = \frac{5}{13}$ is the probability and this is the required Answer.

— (c) —

Data Given :

Average marks of 40 students = 52.15

Error ; Marks of one student were taken to be 49, instead of 85.

To find :

Average marks of class = ?

Solution :

Avg. of 40 students = 52.15

So, we can write it as follows.

$$\text{Avg of 40 students} = \frac{\text{Sum of 40 students marks}}{\text{Total number of students}}$$

$$52.15 = \frac{\text{Sum of } 39 + \underline{49}\ (\text{Error})}{40}$$

$$52.15 \times 40 = \text{Sum of } 39 + \underline{49}$$

$$2086 - 49 = \text{Sum of } 39$$

Sum of 39 = 2037

So, after correcting the error; replacing 49 with 85 we can get results as follows.

Avg of 40 students = $\frac{\text{Sum of } 39 + 85}{40}$

$= \frac{2037 + 85}{40}$

$= \frac{2122}{40}$

Avg. of 40 Stud. = $\boxed{53.05}$ Answer.

Hence, after correction the average of 40 students masks became 53.05.

Section - I B

— (b) —

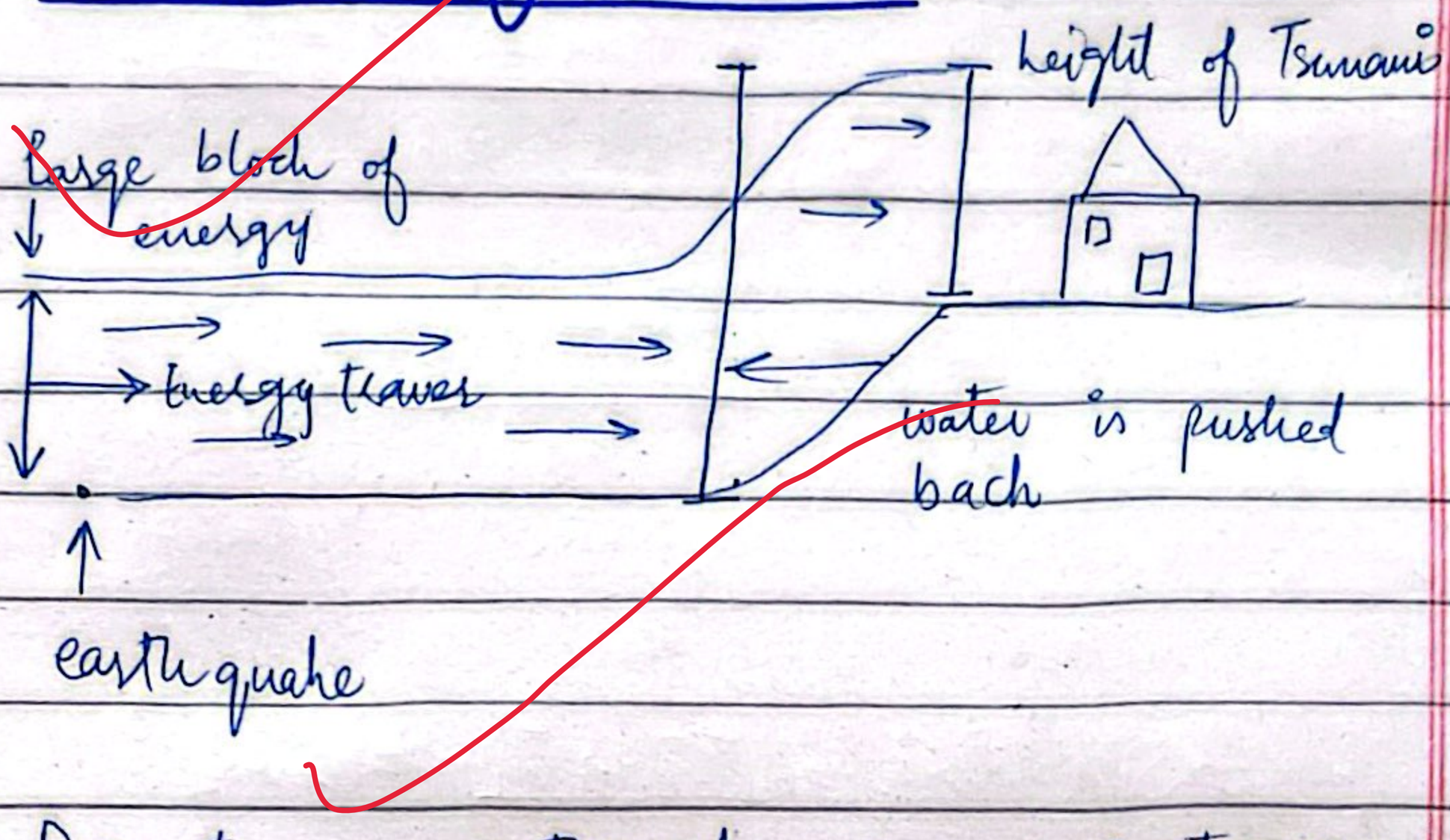
Tsunami

Tsunami is a naturally occuring phenomenon which can cause huge devastation to human and Animal life.

"Tsunami is a large block of water which starts in an ocean

due to an earthquake and this huge wave can attain an height of upto 500 meters"

Formation of Tsunami



Due to an earthquake, energy is transferred to a large block of water which in then carried throughout the water body. When this large wave of water is close to the land, the water is pushed back which is helps in attaining the height of upto 100 to 500 m depending upon the in intencity. Therefore, whenever the Tsunami is on the horizon, water from the beach is usually lesser.

Note: Unlike normal waves, tsunami (a Japenese word) is not caused by the attraction of moon.

Once, Tsunami seaches its full potential it can cause devastation to infrastructure, human lives, vegetation, animals and marine life. Moreover, it is also accompanied by storms and heavy rainfall which further agravates the situation.

Examples of Tsunami

→ Due to increasing change in weather pattern Bangladesh, Australia, Newzealand have repeatedly seen such phenomenon to occur.

A recent report shows that the frequency of Tsunami have increased drastically in Bangladesh from around 3 per years to 5 or more per years.

Similarly, latin America has also frequently seen the devastation of Tsunami.

Environmental Pollution

Environment is everything that surrounds and it can include land, water and

air pollution.

"Environmental pollution means the change in land, air quality and water properties over-time due to man-made activities such as landfilling, vehicular emission and excessive use of fertilizers etc"

Harmful Effects of Environmental Pollution:

Land Pollution

Activities like dumping of waste in open i.e in vacant plots or landfill sites can cause land pollution which can give birth to numerous diseases such as dengue, and other land related diseases.

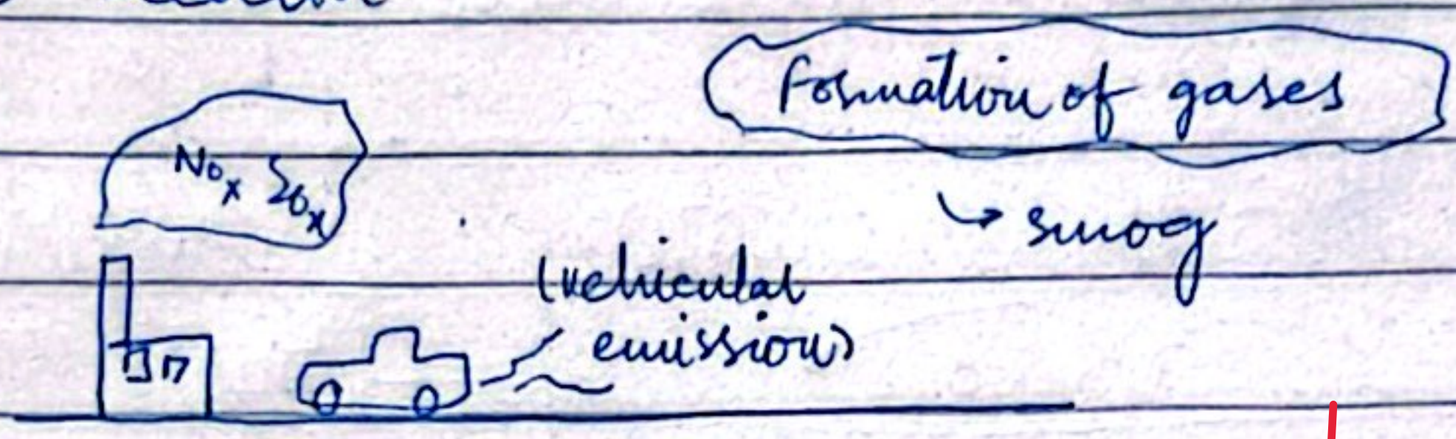
Effects

(a)- Land pollution can deteriorate the aesthetics of a city or a country leading to international shame and decline in tourism

(b). It can also be a heaven for diseases which can be a threat to health security of the country.

Air Pollution

Air Pollution is largely caused by vehicular emissions and industrial burning of fossil fuels. These emissions can include high levels of SO_x and NO_x which can be detrimental for human health.



Effects

(a). Air pollution can be a leading cause of Acid rain which effects human and marine life as well as dry deposition can also effect the buildings over time

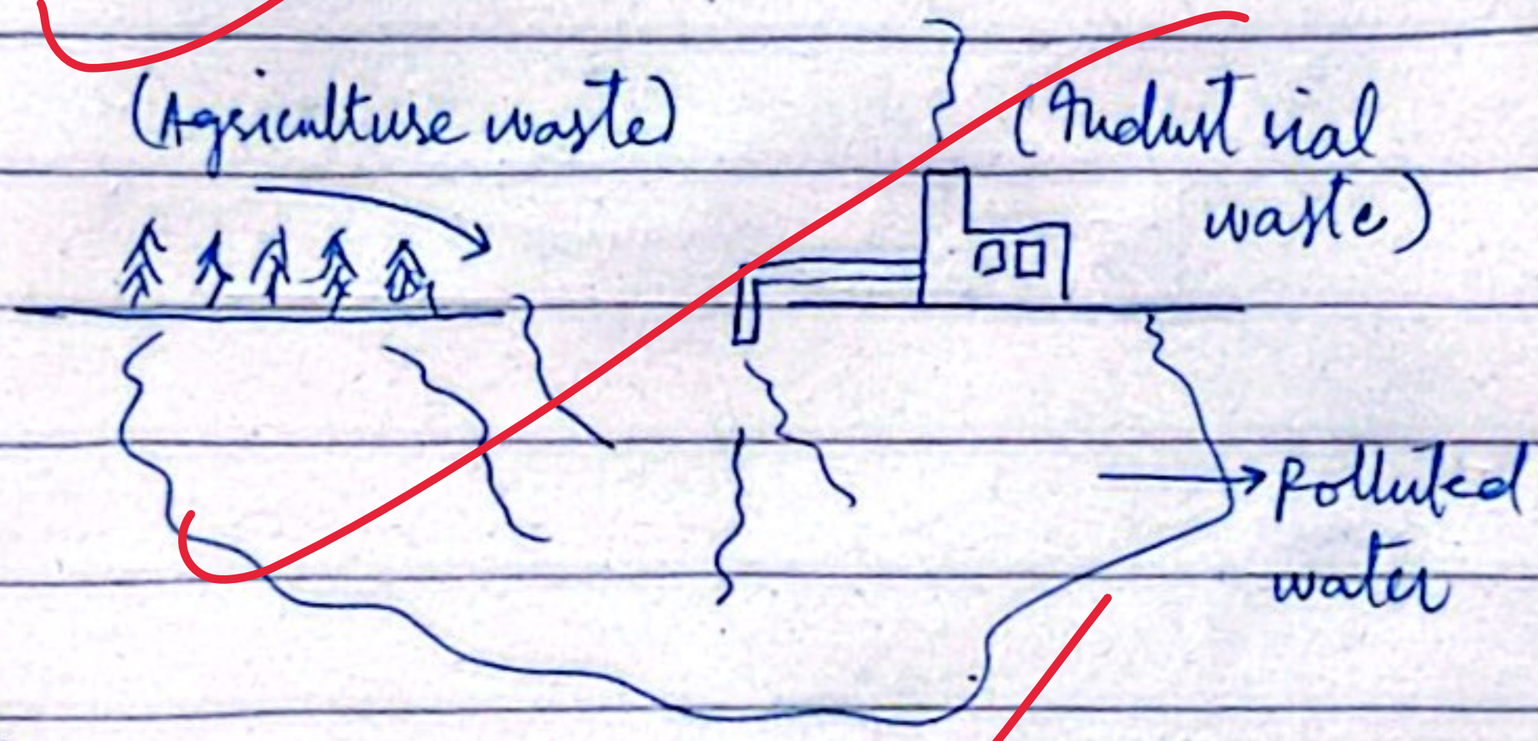
(b). It can cause ozone depletion, which can allow UV rays to reach earth surface.

(c). Smog caused by Air pollutants like Nox and Sulphur oxide can cause serious breathing issue

Water Pollution

"

Water Pollution is caused by agricultural runoffs due to excessive use of fertilizers and it can also be caused by sanitary or industrial waste mis management."



Effects

(a)- Water borne diseases like dengue

(b)- Disruption in Marine ecosystem and overall deterioration of water quality.

Ways To Curb:

(a). Shifting to renewable Energy:

Burning of fossil fuels is the leading cause of Air pollution, shifting to renewable and cleaner energy is needed at the moment.

(b). limited use of fertilizers:

Shift to organic fertilizers (limited use) or the use of hybrid seeds can help mitigate the risk of water pollution.

(C). Investment in solid waste management system

Effective solid waste management can not only preserve the beauty of the city but also prevent us from many diseases.

—(d)—

Wireless Communication

"Wireless communication also known as telecommunication which is done using EMRs such as infrared, radio waves etc"

Use of Wireless Communication

(a). Mobile Phone Carriers

Mobile phone carries companies work on the simpler technique; where signal is tranfered through EMR to tower and comesback to device.

(b). TV Remote / A.C Remote

Similarly, TV/A.C remote uses infrared radiations to send and recieve a signal to complete the communication

(C). GPS - Global Positioning system

GPS is also an example of Telecommunication which use a set/network of satellites.

(d). Bluetooth / Wi-fi Technology

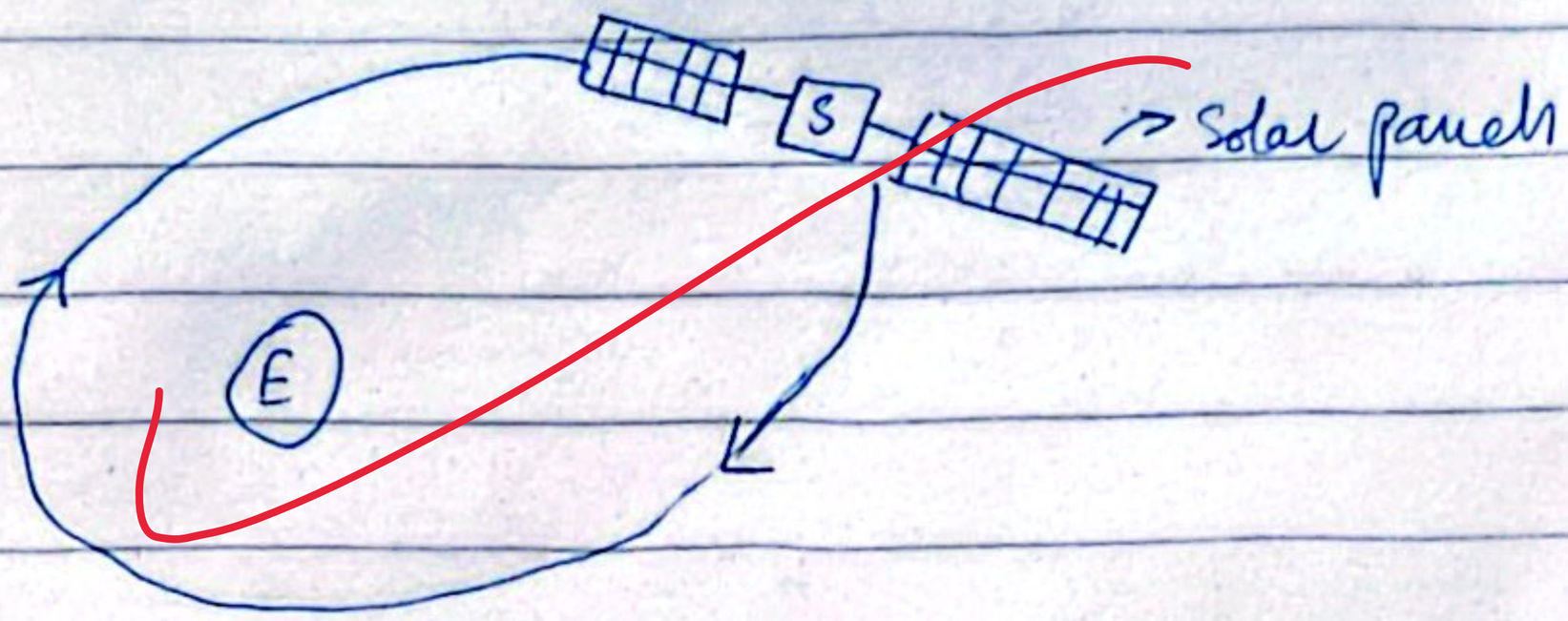
The data we transfer from one device to another is converted into form of radiation under this technology

Working of Satellite

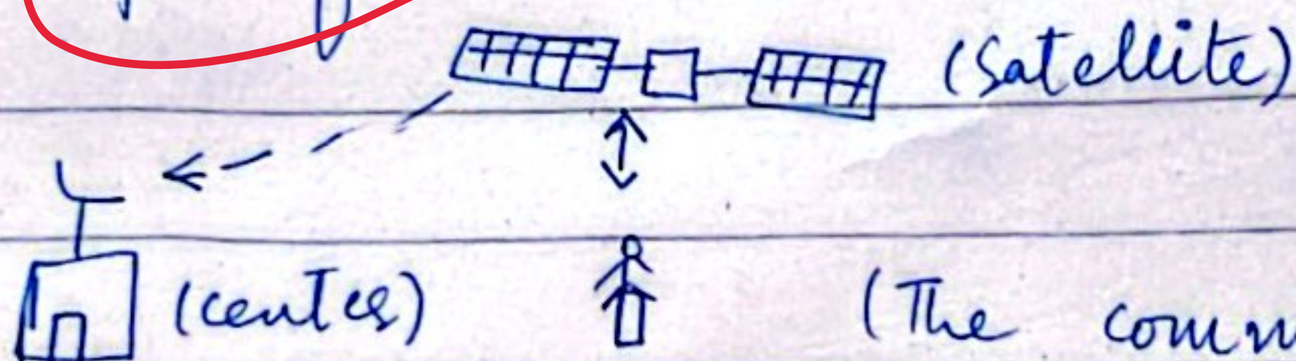
Satellites are of Two Types: man-made/ artificial (Sputnik) or natural satellite (moon).

The Artificial satellite is powered by

solar panels, which constantly revolve around the earth in circular or elliptical manner. The satellites gets signal from the sender and give signal back to the recieves.



Moreover, there is also a communication center that can be setup to track the working of satellite.



(The communication done through satellite is usually two way and it can help to determine many things i.e GPS for position of a specific coordinate and GIS to gather information about the land, forests etc)

Explain complex concepts in simple terms.
Use real-life examples.
Include diagrams and flowcharts for competitive edge.
Discuss practical applications of scientific concepts.
Show all steps and working for calculations.
Use diagrams and graphs