



Q 5a)

Answer

Avalanche

Avalanche is a large mass

General Instructions

of ice, snow, soil, or rocks.

that is sliding down side of

1. Give numbering to headings

2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.

3. Do not use table for comparison and contrast questions.

4. Draw figures/diagram/flowchart where needed.

5. Start new question from fresh page.

6. Write unit of the answer in ability section.

7. Explain mathematical steps and the reasoning for better score.

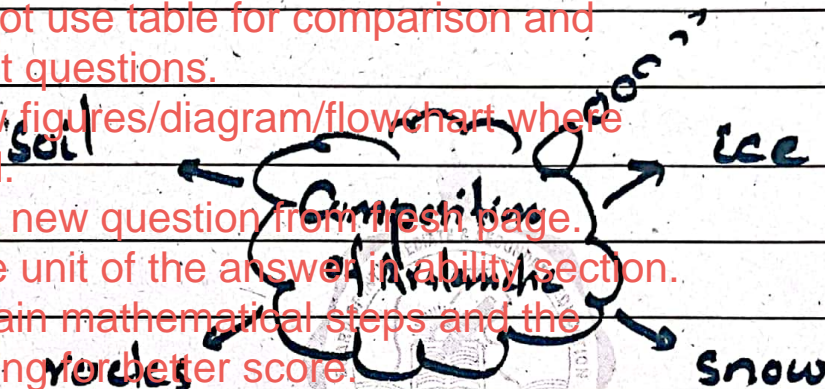
8. Change colour scheme for references to give them more visibility.

9. Manage time well. Types of Avalanche - Examples

10. Wide page borders are discouraged. Should be reasonable. Following are types.

11. Avoid writing wrong references.

12. Give more weightage to expressly asked part/s of the question.



a) House Snow Avalanche

House snow avalanche comes from steep slopes usually after snow fall.

b) Slab Avalanche

Slab avalanche is a huge mass of ice that comes



from large fall of ice.

c) Powder Snow Avalanche

Powder snow avalanche is combination of loose snow and slab avalanche.

"It crosses at 190 mile/hour."

d) Wet Snow Avalanche

It is the quite dangerous avalanche. Wet snow avalanche travels slowly and it is combination of debris, water, and snow.

Types of Avalanche

↓
Loose Snow Avalanche

↓
Slab Avalanche

↓
Powder Snow Avalanche

↓
Wet Snow Avalanche

(2)



Q 5b)

Answer

EM Radiations

EM radiations are spectrum of photon that travels in a vacuum with speed of light.

According to Planck's:

$$E \propto f$$

$$E = hf \quad (h = \text{Planck's constant})$$

as speed of light $c = \lambda f$

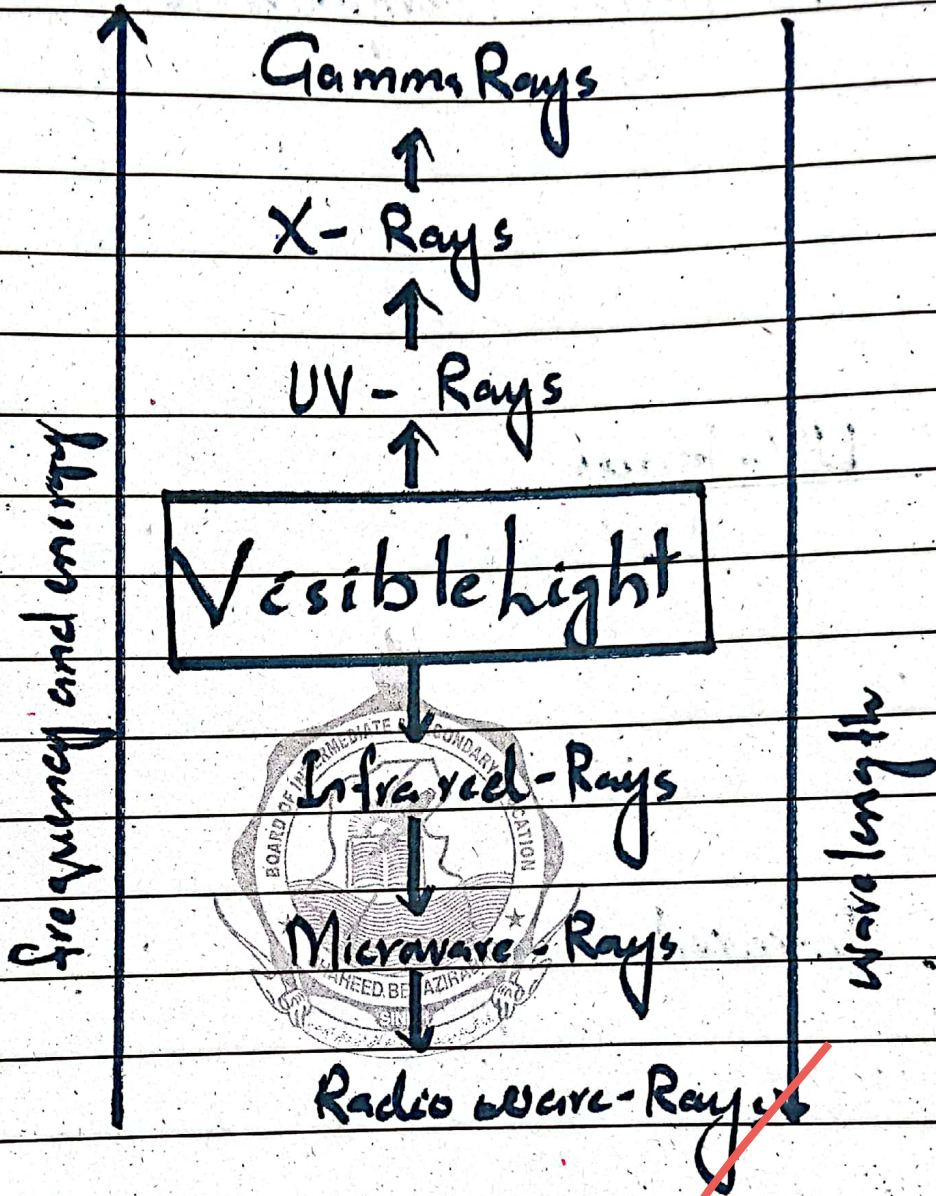
$$\therefore f = \frac{c}{\lambda}$$

now, $E = hf$

so, $E = \frac{hc}{\lambda}$

Spectrum and types of EM Radiations

EM Radiations are defined as follows:



a) Gamma Rays

Gamma rays are highly energetic. These are used in identifying constructive cracks and for medical purpose.

e.g. surgery



b) X-rays (Roentgen Rays)

X-rays are also energetic, but less than gamma rays. X-rays are used to visualize internal body parts.

c) UV-Rays

UV rays are also energetic rays. These are used to convert sunlight into Vitamin-D in human skin.

d) Infrared Rays

Infrared rays are less energetic than UV-rays. In fact, these are used in TV-remote.

e) Microwave-Rays

Microwave rays are energetic rays and are used in microwave ovens, and in radars.



f,

Radio wave - Rays

Radio wave rays are less energetic than microwave rays. These are used for transmission of radio signals, in radars and in satellites.

Q 5c
Answer

Global Positioning System (GPS)

Global Positioning system is a navigation technology. It is composed of twenty-four satellites. GPS was first designed by the US-Defence System in 1973 for military operations.

"GPS - a navigation technology, composed of satellites."

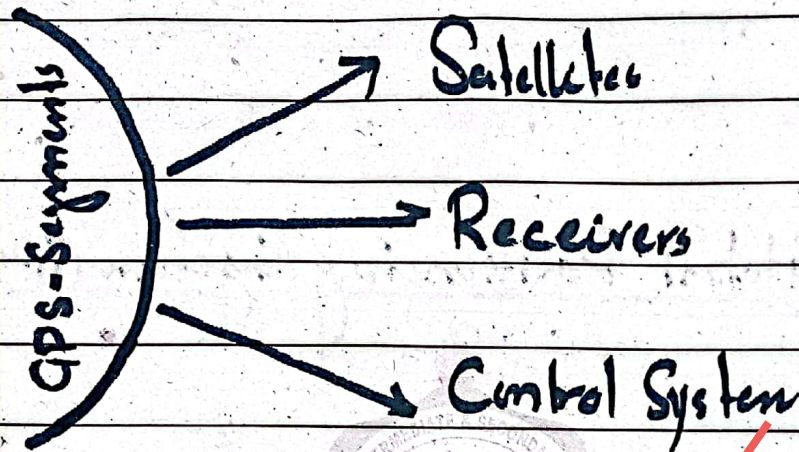
(US-Defence System, 1973)

Working of GPS

GPS is working



with its three segments
that revolves around the
Earth.

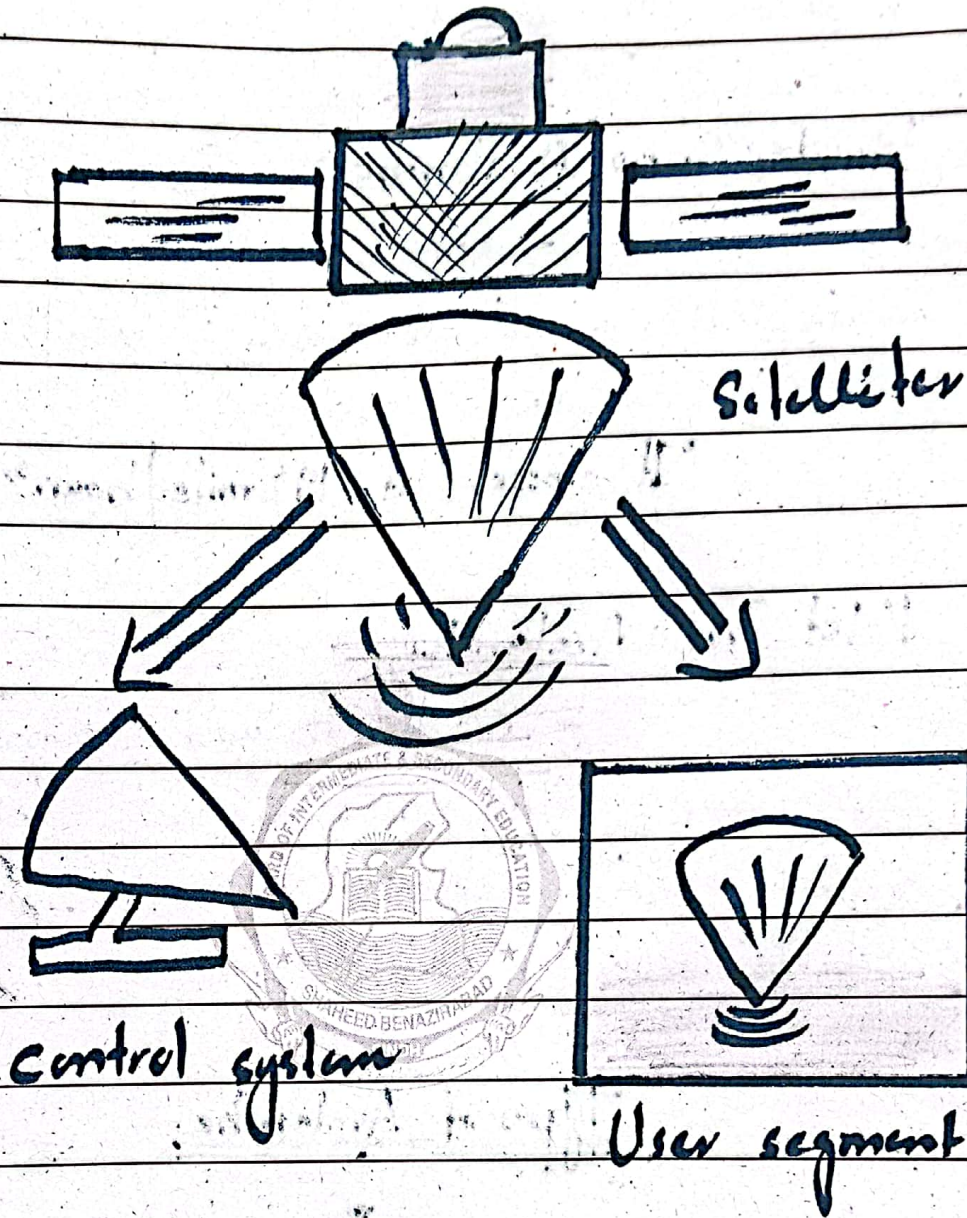


Satellites are used to collect data and receivers will transfer for further process after receiving data.

like mobile phone

Moreover, control system is helping in proper functioning of GPS.

Following is the diagram representation:



• GPS

Q sd)

Computer Buses

Buses are electrical wires through which CPU communicates with other parts of a computer.



"Buses are CPU connectors."

Types of Buses

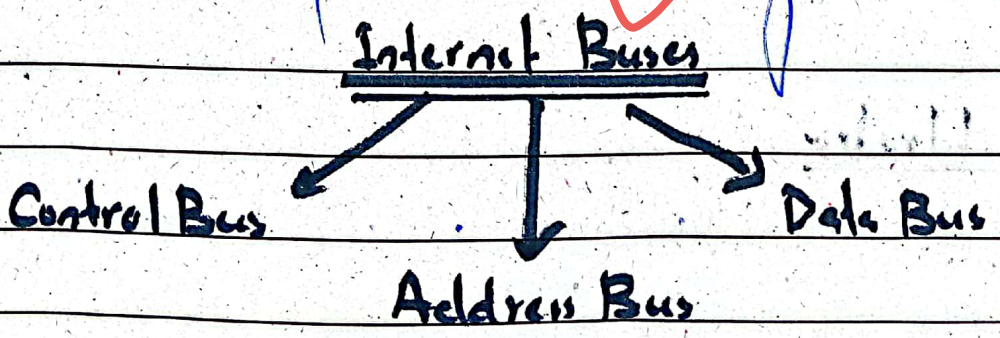
Two types of buses are as follows:

a) External Buses:

These are made up of electronic pathways and connects different devices.

b) Internal Buses:

These are used by CPU. These helps in reading and writing.



• CPU: as a brain of Computer

CPU is working by its three main units.



a) The Arithmetic Unit (AU)

CPU helps in performing arithmetic operations:

i.e., Addition (+),
Subtraction (-),
Division (\div),
and

Multiplication (\times).

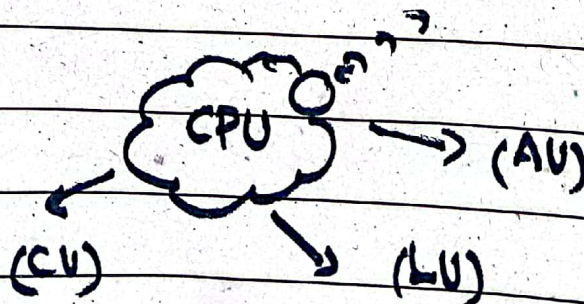
b) The Logical Unit (LU)

It helps in further operations of greater, smaller and equal numbering.

i.e., $>$, $<$ and $=$

c) The Control Unit (CU)

The Control Unit control communication with different parts.





Q3a) Role of kidney in the Urine Formation

Kidney

Kidney is a vital organ.
It helps in excretion process.

Urine Formation

Kidney forms urine by
the system of process.

a) Renal Artery:

Renal artery carries
blood to kidney.

b) Renal Vein:

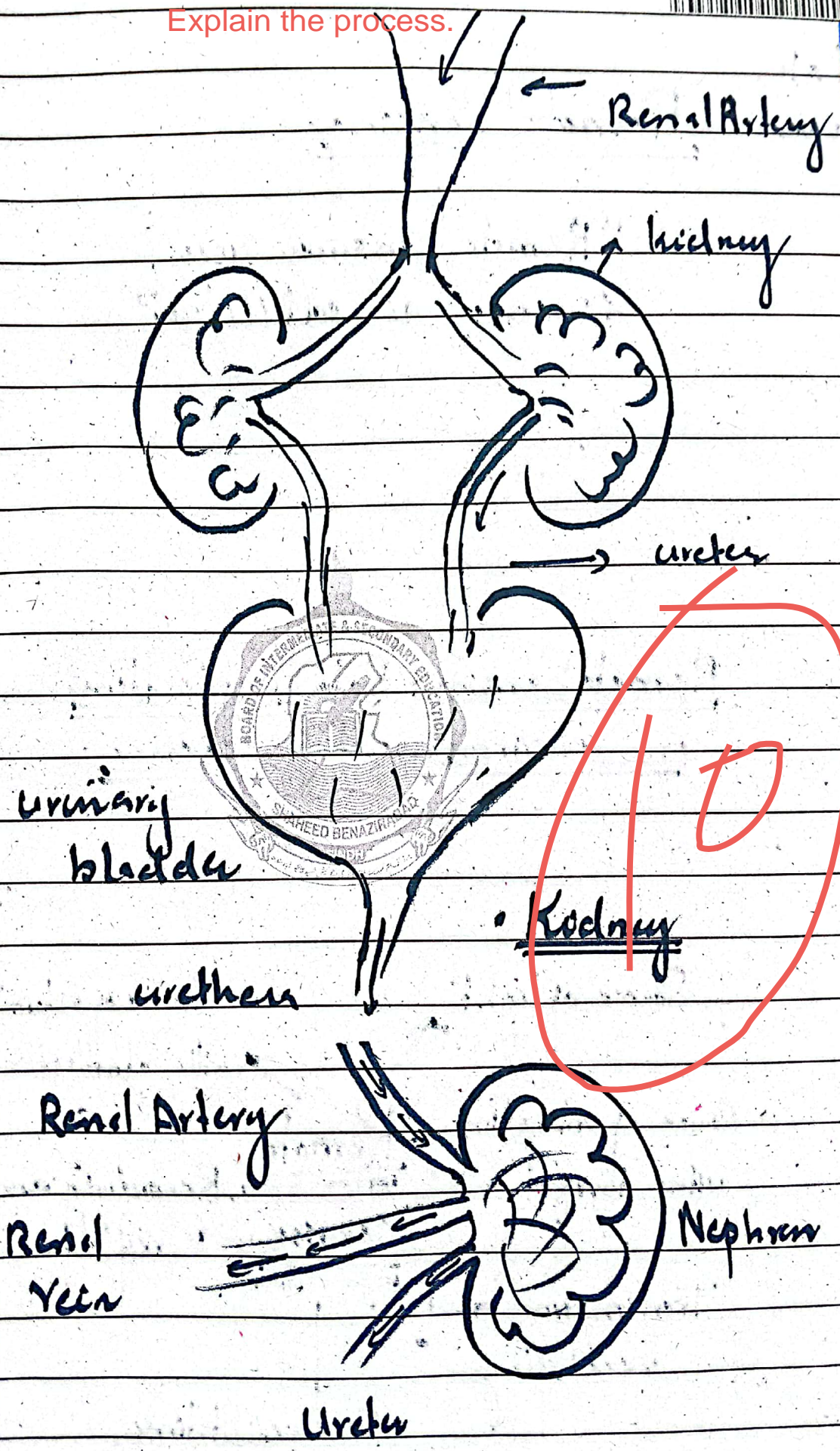
Water, renal vein filtrates
that blood.

c) Ureter

Further, ureter takes away
wastes (urine) from the body.

Therefore, urine is formed by
circulation of blood process in
kidneys.

Explain the process.





Q3b)
Answer

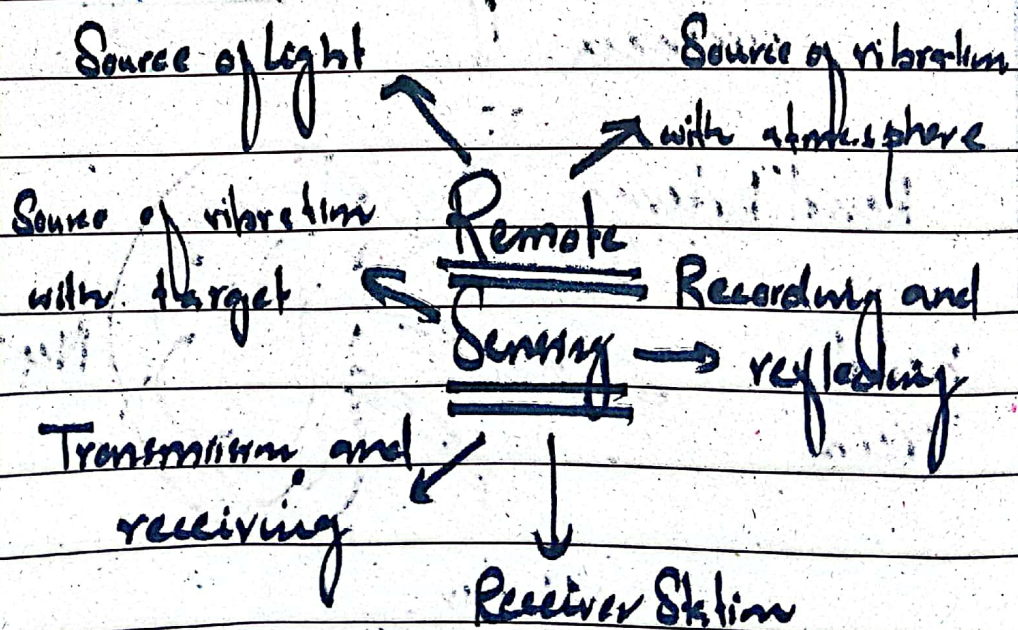
Remote Sensing

"Remote sensing uses sensors as satellites"

Remote Sensing is all about process of geographic information about any area or location.

Remote Sensing: Role / Application in environmental science

Remote Sensing works in an environmental science as below:



a) Source of light

Remote Sensing use sun's energy as a source of light for illumination of objects.

b) Source of vibration with atmosphere

Further, energy interact with atmosphere.

c) Source of vibration with target of interest

Furthermore, energy hits the target of interest.

i.e animals, plants, mountains etc.

d) Recording and reflecting

Moreover, target of interest data is recorded and some of them reflect back.

e) Transmission and receiving

After all, image is transmitted on remote sensing.

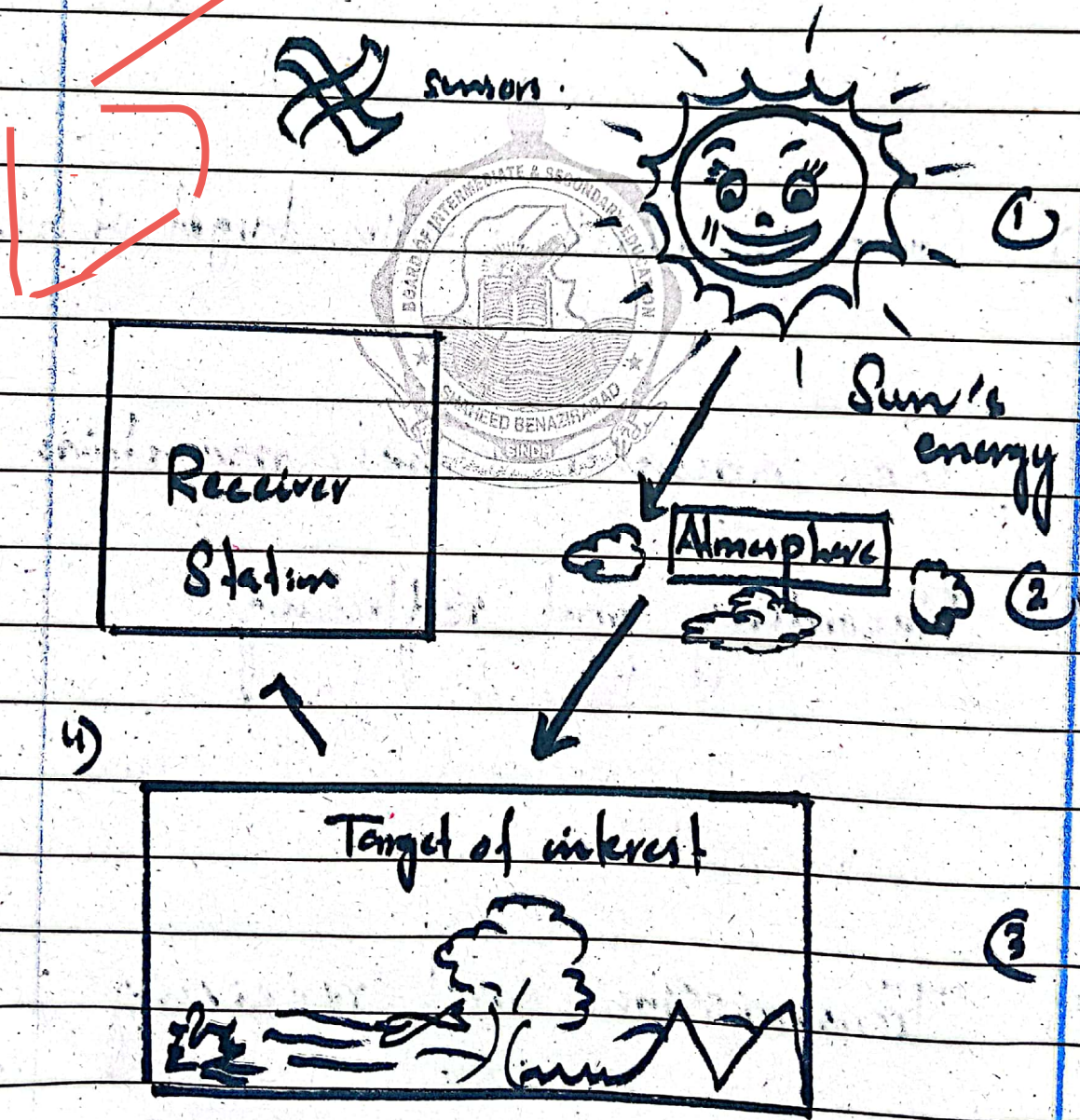
What is its role in environmental studies?



f) Receiver Station

Mostly, image is used for interpretation.

Therefore, all above process has a great application of remote sensing in the environmental science.

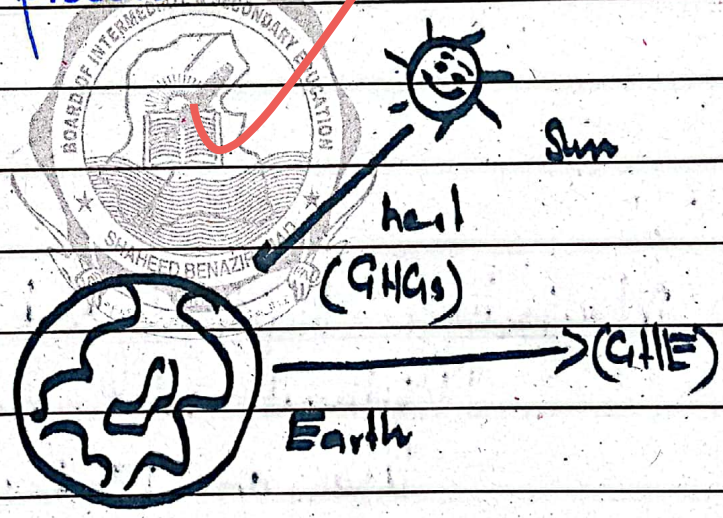


Q3c

Green House Effect (GHE)

"Green House Effect is a 'Thermal Process'."

Green House Effect is a process of trapping heat in the atmosphere under the action of GHGs. In fact, GHE is a normal and natural process.



Benefits of GHE

Following are benefits.

a) GHE = warms the planet

"GHE is a blessing."

(-WHO, 2018)

Green House Effect warms the planet. Hence, keeps life on the Earth comfortable.

b) GHE: an obstacle in harmful radiation pathway

"GHE - protects from the UV rays."

(-UNESCO)

GHE blocks solar radiations and protects the Earth. Therefore, GHE protects from radiations.

c) Maintain Hydrological Cycle

"Without water - no life on Earth."

(-UNESCO)

Moreover, GHE helps in maintaining water cycle process. In fact, it warms the planet and regulates water process.

GHE: contribution in Global Warming

"GHE is a blessing,
but is become
curse, today."

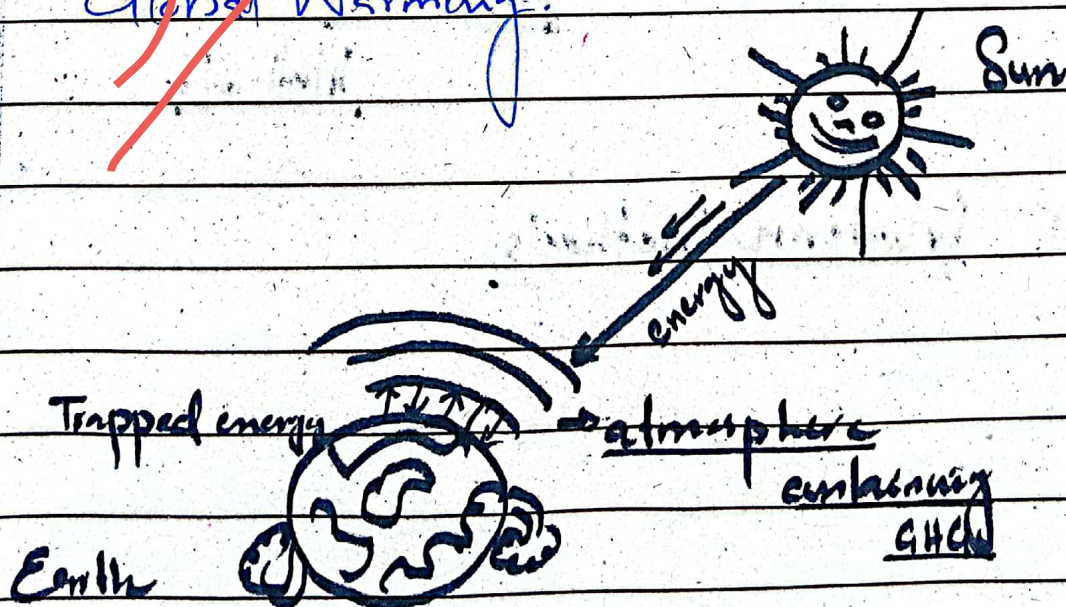
(- Global Air Quality)

GHE at certain level
not harms the environment. But,
when its concentration increases
in the atmosphere, it contributes
in heatwaves.

"The forecasted temperature
is 1.1 to 5.0°C ."

(- The World Bank, 2023)

Therefore, GHE contributes in
Global Warming.



Global Warming

Q3d

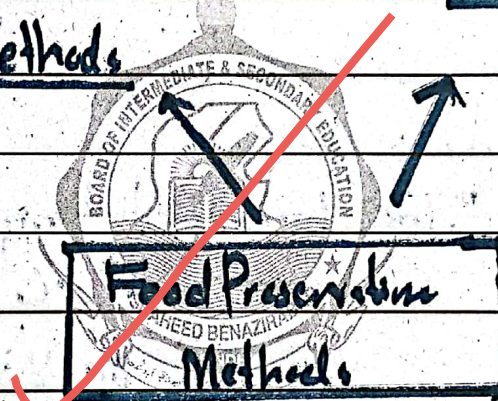
Answer

Food Preservation

"Food Preservation is a process of keeping food safe."

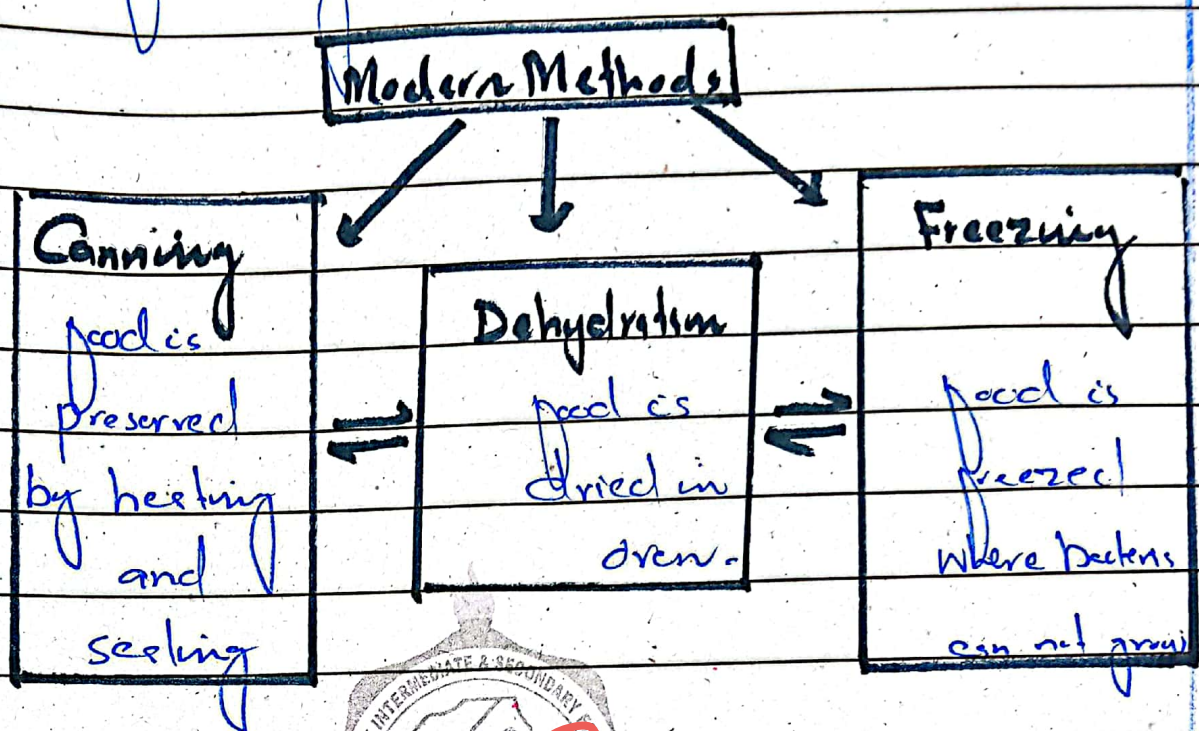
Food Preservation Methods

Following are methods:

NaturalMethodsModernMethodsArtificialMethodsa) Modern Methods

"Process of keeping food safe from spoilage."
Food can be preserved by

Following modern methods:



b) Natural Methods

Food can also be preserved by certain natural processes.

- i.e. salt, sugar, alcohol, vinegar, citric acid etc.

c) Artificial Methods

Moreover, food can also be kept safe by artificial methods.

- i.e. anti-oxidants, anti-micro-bial etc.



(Section - B)

Q(6a)

Data:Age of son, 5 years ago;
son = x Age of father, 5 years ago;
father = $3x$

now,

son is 30 years old,

son = $x = 30$ yearsWhat is current age of father?Solution:

5 years ago =

$$x = 3x$$

today, $x = 30$

So, $x = 3x$

put the value of x ,

therefore, $x = 3(30)$

$$x = 90$$

Age of son is, 30 years
and



age of father is 90 years today.

Q 6b)

Answer

Data:

A man's income = x

income tax = 10pc

$\therefore 10\%(x)$

his income tax amount is,

Rs 1500

What's his income?

Solution

income tax price = Rs 1500

10pc = Rs 1500 of what?

$\therefore \frac{1500 \times 100}{10}$

= 15000

Hence, his income is

Rs. 15,000



Q 60

Answer

Data

The arithmetic mean of
6 numbers = 20

After, removing one number,
average of five = 15

Which number was removed?

Solution:

$$\text{Average} = \frac{\text{Numbers}}{\text{Number of numbers}}$$

Average of first 6 numbers = 20

$$\text{average} = \frac{\quad}{6} = 20$$

$$\therefore, 6 \times 20 = 120$$

now, average of five numbers, after
removing one number,



$$\text{average} = \frac{\quad}{5} = 15$$

$$\therefore 5 \times 15 = 75$$

$$\text{Missing number} = 120 - 75 = 45$$

Therefore, missing, remained number was 45.

Q6d)

Answer Missing Numbers

i) 8, 4, 32, 7, 5, ?

first series:

8, 4, 32

$$\begin{aligned} (4 \times 2 &= 8) \\ (8 \times 4 &= 32) \end{aligned}$$

So,

7, 5, ?

$$5 + 2 = 7$$

$$7 + 5 = 12$$

So, the missing number is 12.

ii) 17, 19, 23, ?, 31, 37

These are prime numbers.

Therefore, missing number is 29.



Q7a)

Data

Answer

Diameter of a round table = 7m

What will be the distance around it?

Solution:

$$\text{Distance (circumference)} = 2\pi r$$

$$D = 2r$$

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

$$\text{So, } r = \frac{7}{2}$$

$$\text{now, distance} = 2\pi r$$

$$= 2 \times \pi \times \frac{7}{2}$$

$$= 7\pi$$

Therefore, distance is = 7π - OR -

$$\text{as, } \pi = 3.14$$

$$\therefore 7(3.14)$$

21.98 meter Answer



Q7 b)

Data:

three-fourths of boys = 18

total boys = two-thirds

How many are girls?Solution

$$\frac{3}{4} \text{ of } \frac{2}{3} \text{ of (total number of students)} = 18$$

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

$$\frac{18}{12} \times x = 18$$

$$x = 36$$

Total students in a class are 36

now, two-thirds are boys

$$= \frac{2}{3} \times 36 = 24$$

If boys are 24; then,

$$\begin{aligned} \text{girls} &= 36 - 24 \\ &= 12 \end{aligned}$$

Therefore, girls are 12. Answer.



Q7 c)

Answer

Intelligence Quotient (IQ)

IQ is a measure of a person's general ability in terms of intelligence.

Emotional Intelligence (EQ)

EQ is ability to perceive and control emotions.

Difference between IQ and EQ

<u>Comparison</u>	<u>IQ</u>	<u>EQ</u>
a) nature	IQ is related to intelligence ability.	EQ is related to emotional ability of intelligence.
b) source	IQ is natural.	EQ is a social skill.
c) influence	IQ works in schooling.	EQ works throughout life.

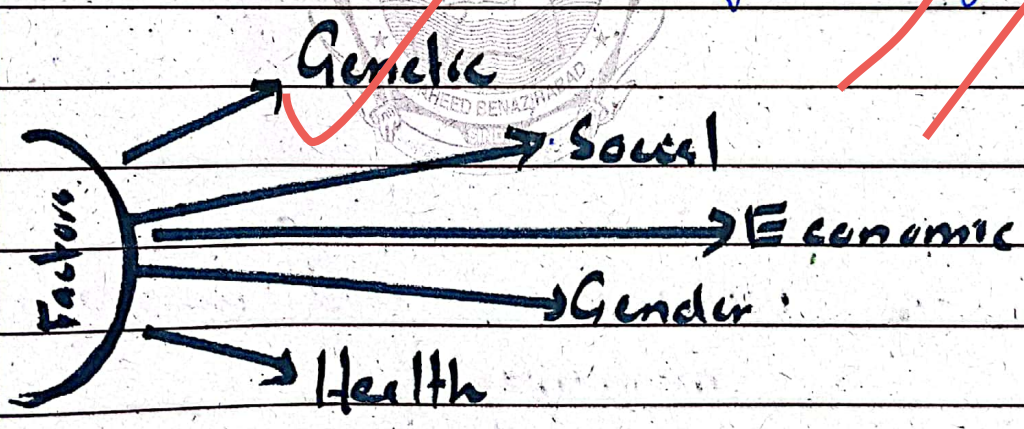


approach	IQ is quantum approach.	EQ is adoptive approach.
examples	better comprehension, memory etc.	self-awareness, self-regulation, and empathy.

"IQ + EQ = Success"

Factors affecting IQ

Following are factors:



1) Genetic Factors

Intelligence traits come from parents. Therefore, IQ is affected by genetics.



b) Social Factors

Environment also influences IQ of a person.
 i.e., home, education, learning etc.

c) Economic Factors

Moreover, financial issue as bad or financial as good also affects intelligence.
 i.e., finance of parents

d) Gender Factors

Further, gender as 'Gender Studies' subjects has influence on IQ.

i.e., women are good in memorizing and men are good in numbering.

e) Health Factors

Health also affects IQ.
 i.e., a healthy man is considered as intelligent.



Q.7d) Data

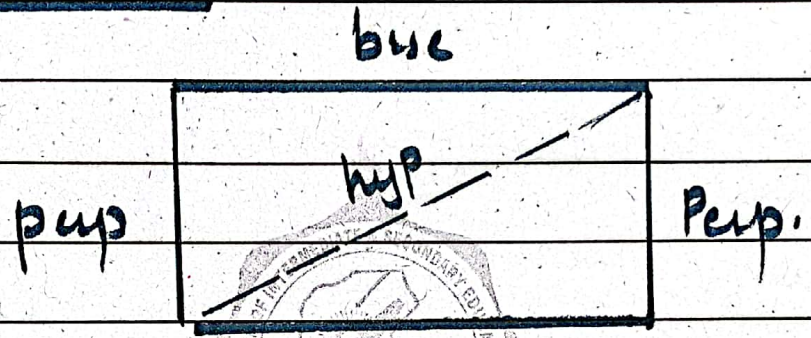
perpendiculars = 240

width = x

length = $3x$

What will be perimeter?

Solution



~~$$\text{perp} + \text{perp} = 240$$~~

~~$$\therefore \frac{240}{2} = 120$$~~

as, width = perpendicular = 120

so, length = $3 \times 120 = 360$

now, $\boxed{\text{Perimeter} = 2(l+b)}$

$= 2(360 + 120)$

$= 2(480)$

$= 960$ Answer.