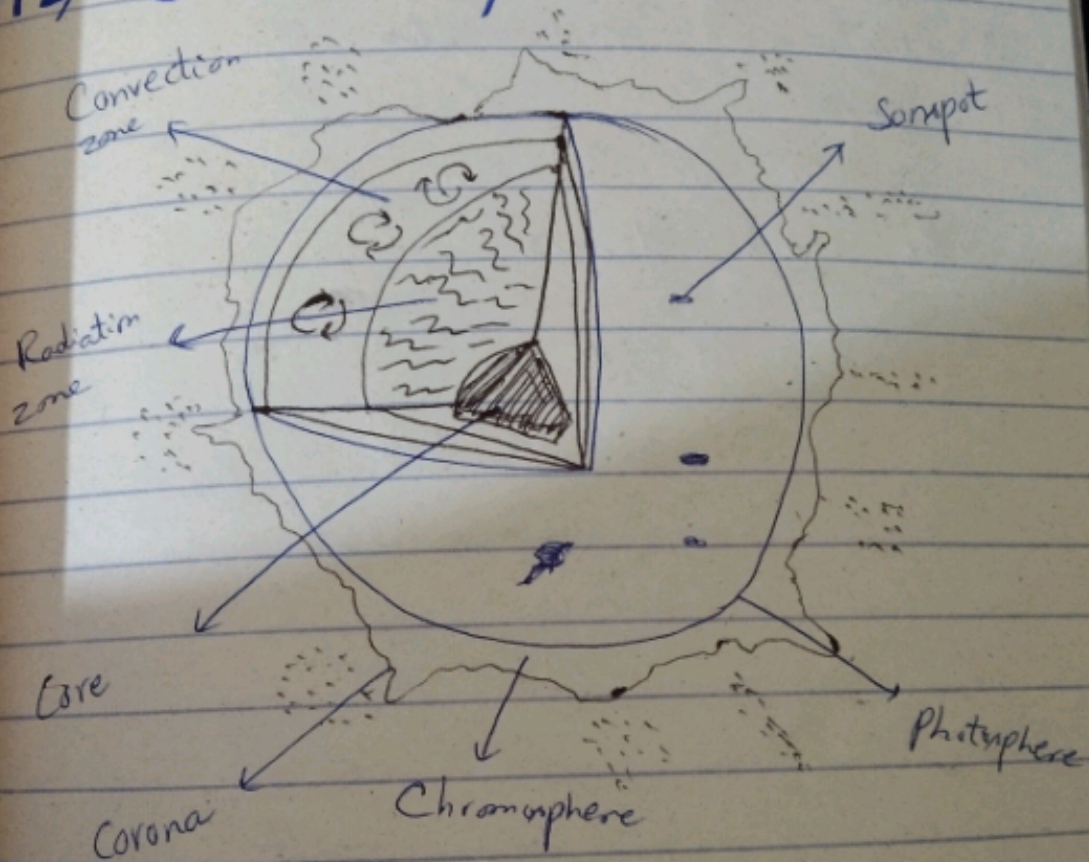


Question: NO 3

SECTION - 1

A → Structure of the Sun



Explaining structure of Sun

- Sun is a star around which the Earth and other components of solar system revolve. It constitutes 99% of mass of solar system. It is enormous source of energy and light.

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It is a huge ball of gases (H, He)  
The surface temperature of the  
Sun is 58000 kelvin. That's why  
it is an extremely hot body in  
the solar system.

## i) Structural Components of Sun

There are 3 main parts of  
the Sun's interior:

- 1) The core
- 2) The radiative zone
- 3) The convective zone.

The core is at the center. It is the  
hottest region where nuclear fusion  
reactions occur. It is the only section  
of the Sun that produces about  
15 million Celsius heat through  
fusion reaction.

The radiative zone:

In this zone the  
heat energy is carried away from the  
core through energy photons known  
as thermal radiations. The material  
in this zone is dense and hot.

The convective  
zone because  
in the form  
The material  
surface of con  
downward  
upwards &  
in this

The outer  
are called

The photosphere

exterior  
is known

the S

Chromosphere

atmosphere

and yellow

Corona is

the

## The Convective zone.

It is named convection zone because energy moves in this zone in the form of convective currents. The material cools off at the outer surface of convective zone then it flows downward to absorb heat then moving upwards & downward air currents occur in this portion.

The outer 3 layers of Sun's atmosphere are called

- 1) The photosphere
- 2) Chromosphere
- 3) - Corona

The photosphere: A boundary between the interior of Sun's structure and exterior environment of the SUN. It is known as the visible surface of the SUN.

Chromosphere: The lower region of solar atmosphere is chromosphere. It appears red and yellow when viewed in solar eclipse.

Corona: The outermost hot air encircling the Sun's atmosphere is called corona.

(b) (i) TSUNAMI

"A tsunami is a catastrophic ocean wave, usually caused by earthquakes, coastal landsliding and under water volcanic eruption."

(ii) How Tsunami is generated?

Any underwater activity that causes the massive waterbed to displace result in tsunami.

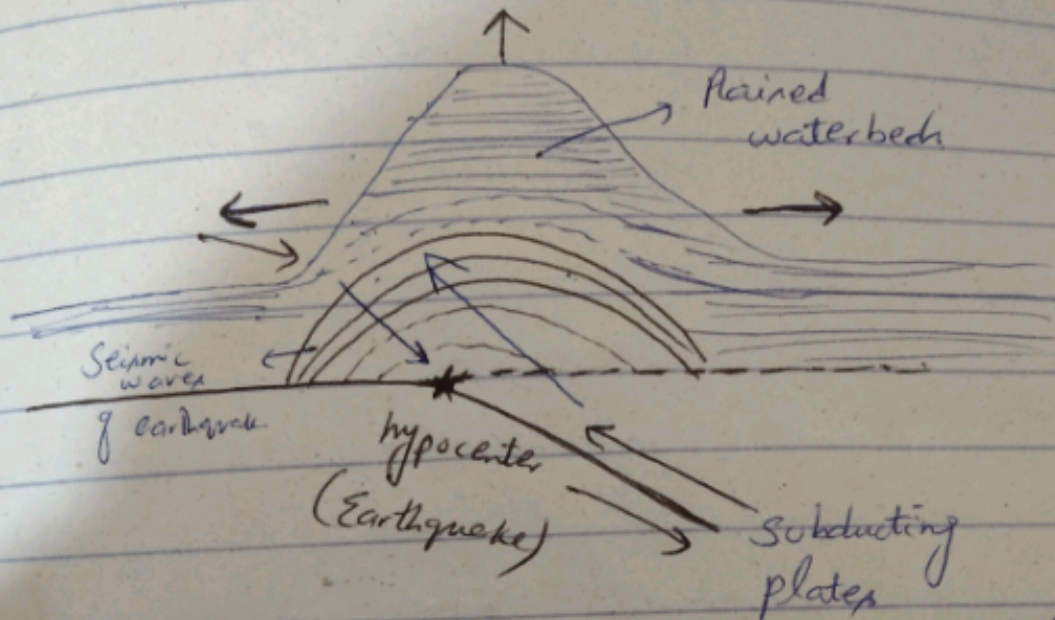
Mainly tsunami is generated after an earthquake.

→ The earthquake generates impulses, these impulses disrupts the speed and height of normal waves. The progressive oscillatory wave is propagated over the ocean's surface in widening circles. Thus, adding to the height and speed of the waves at the ocean.

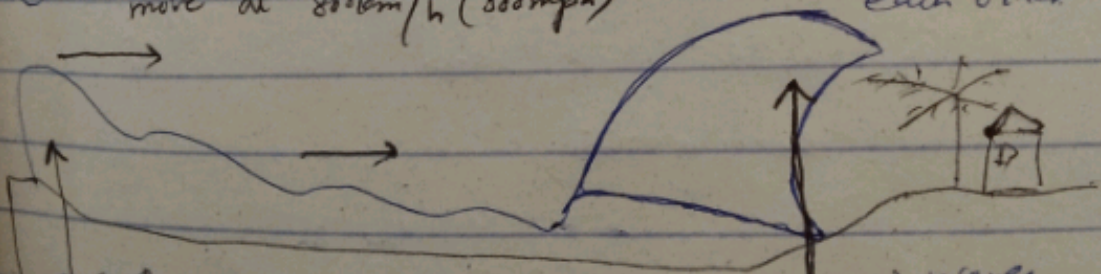
In deep water, tsunami can travel as fast as 800 km/h.

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

As the waves approach the coast, they are repulsed and its wavelength decreases while amplitude increases due to friction against coast.



② Large wave form and move at 800km/h (500mph)



3) Waves slow in shallow water but increase in height.

### (3) iii Examples of recent tsunamis

(a) Hualien Taiwan with an earthquake of 7.5 magnitude generated this tsunami

## (C) Environmental Pollution

Environmental pollution is a broader term that can be broken down into 4 types of pollution:

- 1) Water Pollution
- 2) Air Pollution
- 3) Land Pollution
- 4) Noise Pollution

Any undesirable change in the physical and chemical characteristics of air, water and land can pollute our environment.

Water pollution refers to the addition or extraction of any component in water to alter its physical or chemical properties, it is called water pollution.

Causes of water pollution

There are many causes of water pollution, some notable causes are industrial wastewaters, domestic sewage, microbial activity

Air-poll  
Compo  
Nitro  
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Cause

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CFC

Land p

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Causes

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 due to agricultural discharge in water reservoirs.

Air-Pollution:- Any contamination in normal composition of air (Carbon dioxide 0.04%, Nitrogen 78%, Oxygen 21%, Argon 0.93%) in the form of gases, dust and green house gases is called air pollution.

Causes of air pollution  
The industrial gases, (thermal power plants) fumes of fertilizers, the oxides of sulphur and nitrogen from the discharge of motor vehicles. Similarly CFCs and wild fires also contribute to air pollution.

Land pollution:- The Degradation and destruction of the Earth's surface and soil directly or indirectly as a result of human activities is called land pollution.

Causes of land pollution  
Deforestation, increased use of pesticides, improper solid waste management, urbanisation and mining activities.

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Noise pollution: It refers to harmful and unwanted sounds that disrupt the natural balance of the environment, affecting both human health and wildlife. A prolonged exposure to sounds above 85 db considered harmful.

Causes of noise pollution,

Industrial activities, transportation increasing urbanisation, household activities and social events.

(ii)

## Effects of Pollution

1. Water pollution
  - Depletion of oxygen from water thus suffocating aquatic life.
  - Spread of infectious diseases like hepatitis, TB and polio, Diarrhea.
  - Eutrophication of water reservoirs depletes oxygen.
  - Acidification of water column.

2-  
3. LAND

4- Noise P



2- Air pollution

Global warming due to green house gases

Acid rain, smog formation

Respiratory infections due to aerosols, pollen allergy

Ozone depletion due to CFCs.

3- LAND POLLUTION

Introduces toxins in groundwater through leachate.

Contamination of food Deteriorates human health and spread of respiratory and skin diseases.

Destruction of scenic beauty.

Loss of biodiversity

4- Noise pollution

hearing loss, sleep disturbance, anxiety and Cardiovascular issues

Disruption of habitats of wildlife

Date: / /  
iii) Measures to Curb Environmental Pollution

A comprehensive approach is necessary to curb the environmental pollution.

Measures to Curb water pollution

→ 1) Proper disposal and containment of toxins in industrial wastes before entering into water bodies

2) By implementing renewable energy resources to reduce the use of fossil fuels in industries.

3) By Developing the eco-friendly products and recycling of waste material to reduce the littering in ocean bodies.

Measures to Curb Air Pollution

1- Incorporation of air pollution control equipments in the industries

2- use of catalytic converter in motor vehicles to reduce the oxides of nitrogen and sulphur emissions.

3- Encourage people to use public transport

9) wind energy  
hydro power.  
By promoting and aff  
Measures to Control Land Pollution

(2) recycle able

(3) Use of crowded

(4) Populati

Measures to Curb Noise Pollution

(2) to a

(3) poll urban

(4) Ci  
Zoning area

9) use of renewable energy sources like wind energy, solar energy and hydropower.

By promoting the cultivation of trees and afforestation to reduce GHGs.

Measures to Control Land Pollution

(1) - Solid waste management techniques can help to control land pollution.

(2) Promote the production of recyclable and reusable items

(3) Use of proper planning to avoid crowded urbanisation.

(4) Population planning

Measures to Control Noise Pollution

(1) - Enforcing legislation and regulation measures to control noise.

(2) Public awareness campaigns to aware them of harms of noise pollution.

(3) urban planning to avoid over-crowded cities

(4) Zoning laws to avoid residential areas near noisy areas

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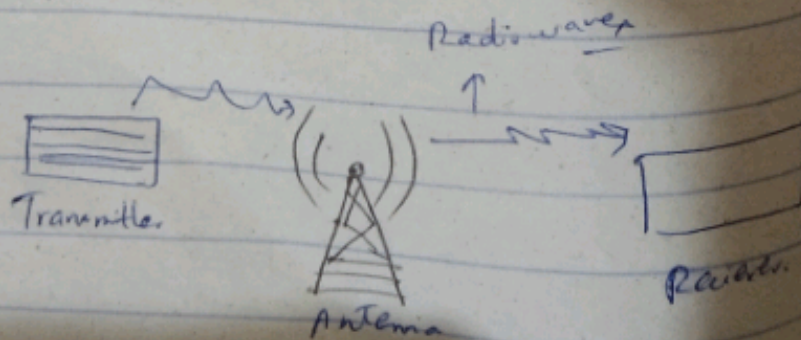
## (d) (i) Wireless Communication

"Wireless Communication refers to the use of radio waves for the distant communication without the use of wires."

The key components of a wireless communication are as follows

Follows

- 1) Transmitter
- 2) Receiver
- 3) Antenna
- 4) Modulator
- 5) Demodulator
- 6) Communication Channel



## (ii) Working of a satellite

A satellite are used for communication

purpose.  
from  
transmit  
receiver."

data collati  
and comm

Transmits  
the data/  
information  
to the  
ground  
station

## Question

(A) Di

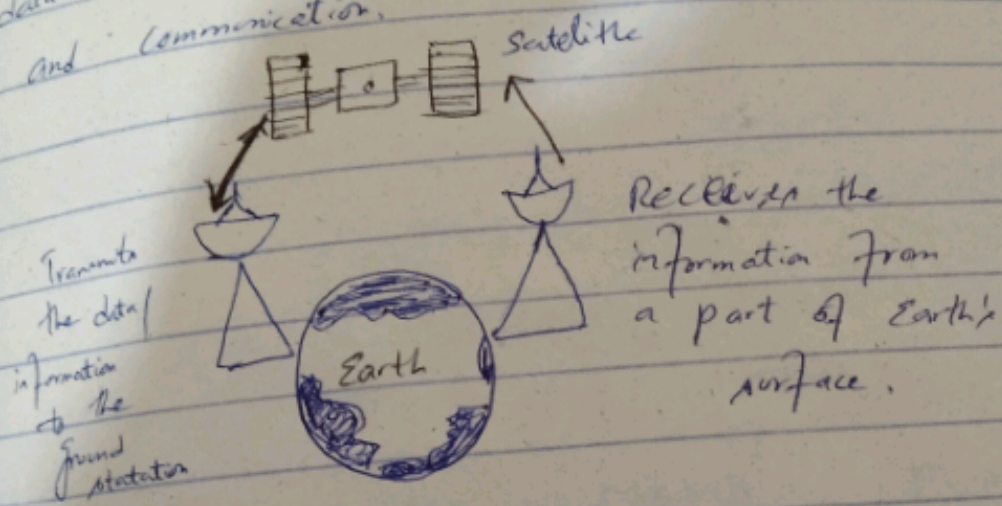
Pro

Pro karyotic ce

Prokaryotic mean  
without

purpose. They receive the EMG signals from Earth amplify them and transmit these signals to the receiver."

They are used for data collation, information transmission and communication.



# Question: No 5

(A) Difference b/w a

Prokaryotic cell & an Eukaryotic cell

Prokaryotic cell

Eukaryotic cell

Prokaryotic means "without nucleus"

Eukaryotic means "true nucleus"

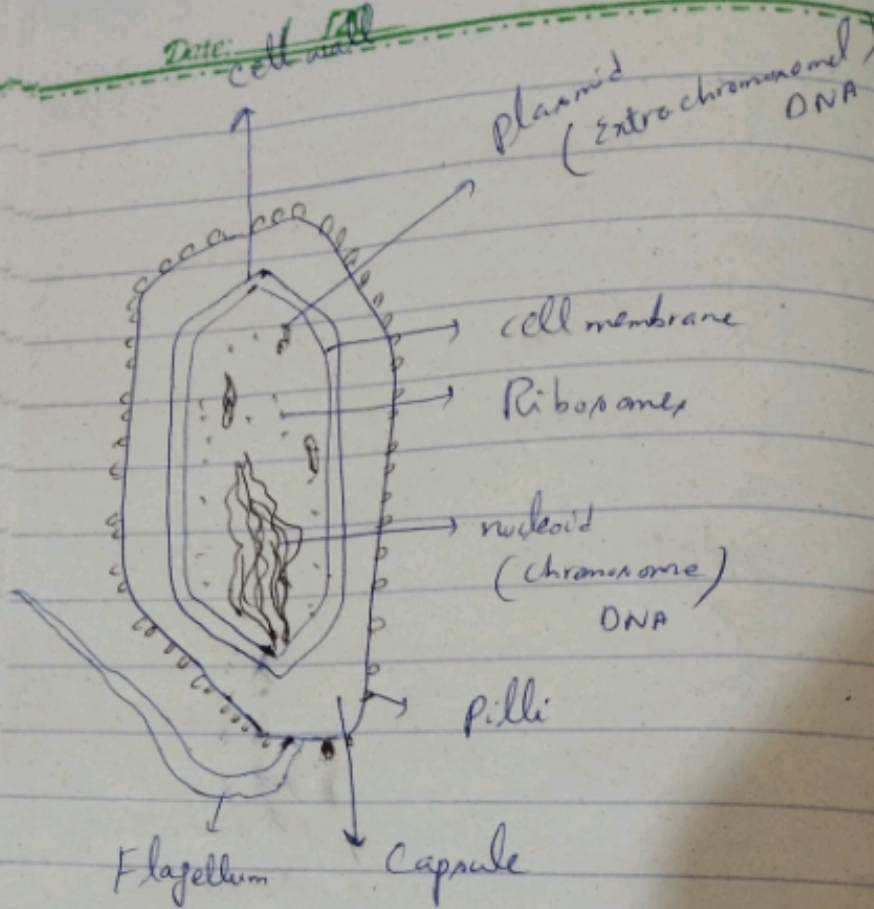


Fig. 1 Prokaryotic cell

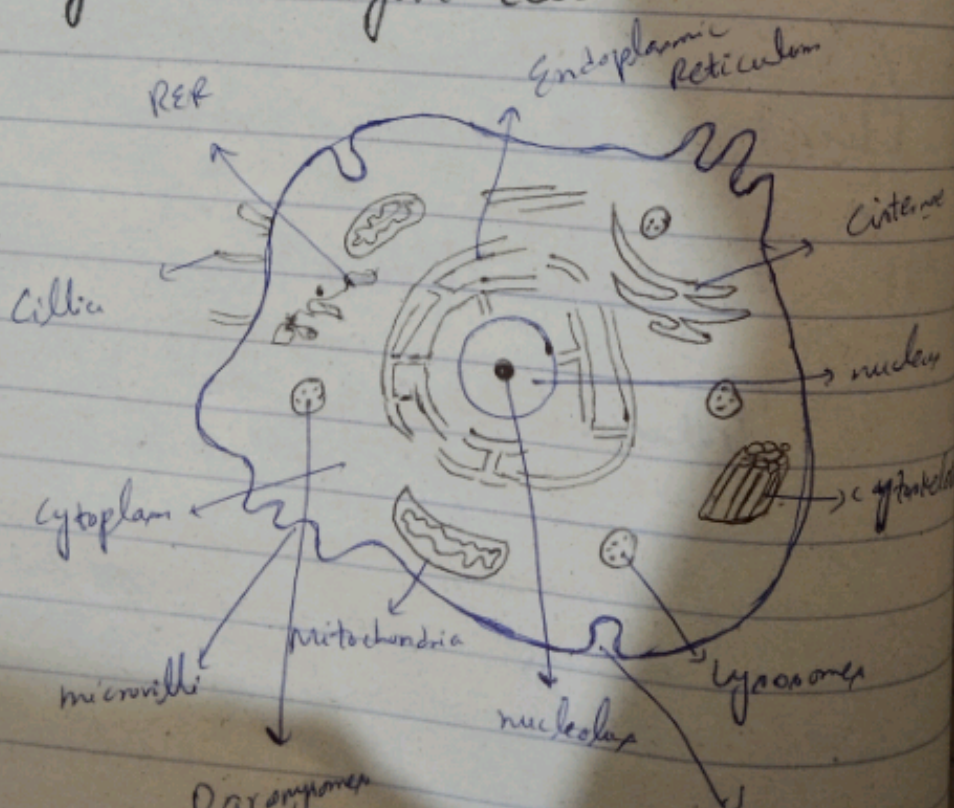


Fig: 2 Eukaryotic cell

- Any unicellular without membrane organelles prokaryotic
- Do not have a banded nucleolus portion of cytoplasm chromosome in nucleoid.
- It's size varies 4-5mm or e
- It replicates genome at through or asexual
- It has only smaller with

120  
Prokaryotic cell

- Any unicellular organism without membrane bounded organelles is called prokaryotic cell.

- Don't have a membrane bounded nucleus. The portion of cytoplasm with chromosome is called nucleoid.

- It's size ranges from 4-5mm or even smaller.

- It replicates the entire genome at once through binary fission or asexual reproduction.

- It has only smaller unit of Ribosomes with 70S.

## Eukaryotic cell

- Any cell in a multicellular organism with membrane bounded organelles is called eukaryotic cell.

- It has proper membrane around nucleus separating the nuclear material from the cytoplasm.

- It's size ranges from 10-100mm.

- It replicates the selective genome and passes on the selective genetic material through sexual reproduction.

- It has two units of Ribosomes 80S & 80S.

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• Cell wall is always present and it has a complex structure.

• Cell wall is present around the plants cells while absent in animal cells.

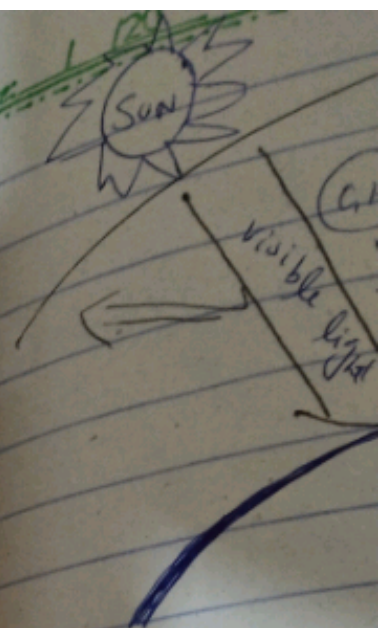
## (b) Global warming

"Global warming is a phenomenon that is mostly occurring due to increased emission of green house gases such as methane, carbon dioxide and hydrocarbon gases."

During global warming the GHGs entrap the (long wave) short-wavelength IR (infrared radiations) from the Earth in the atmosphere. Thus, increase the temperature of atmosphere.

### Causes of global warming

- i) Burning of fossil fuels
- ii) Deforestation
- (iii) Increased use of diesel and petrol based modes of transport
- (iv) Industrial waste gases



## Kyoto

treaty adopted  
The protocol  
The aim

combat climate  
the emission

The to  
participating

six  
CO<sub>2</sub>, C

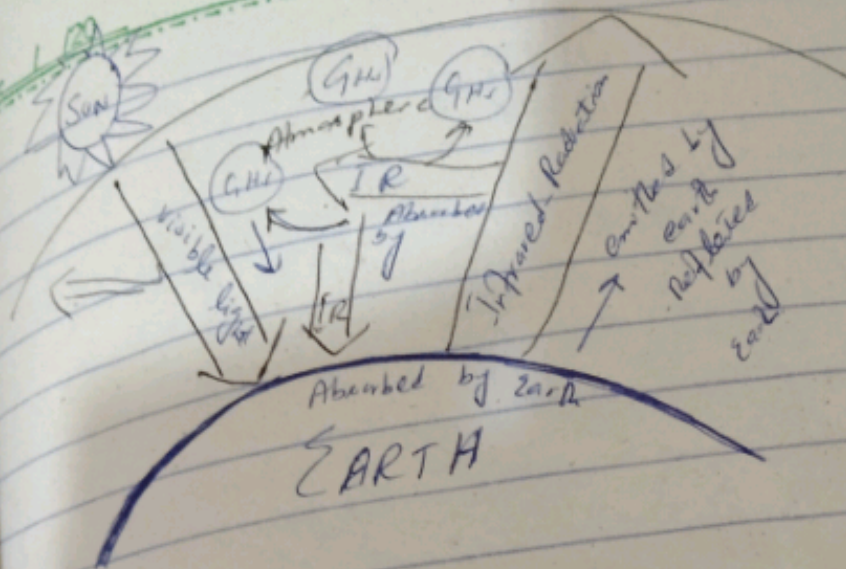
The mechanism  
emission

mechanism  
emission

The Kyoto  
Paris



GHGs reflect the IR Day back towards Earth



## KYOTO PROTOCOL:-

It was an international treaty adopted in 1997 in Kyoto, Japan. The protocol was enforced from 2005.

The aim of this protocol was to combat climate change by reducing the emission of green house gases.

The treaty legally binding for participating countries and targets

six major GHGs including  $\text{CO}_2$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$ .

The mechanism of this protocol were emission trading, clean development mechanism and collaborating on emission reducing projects.

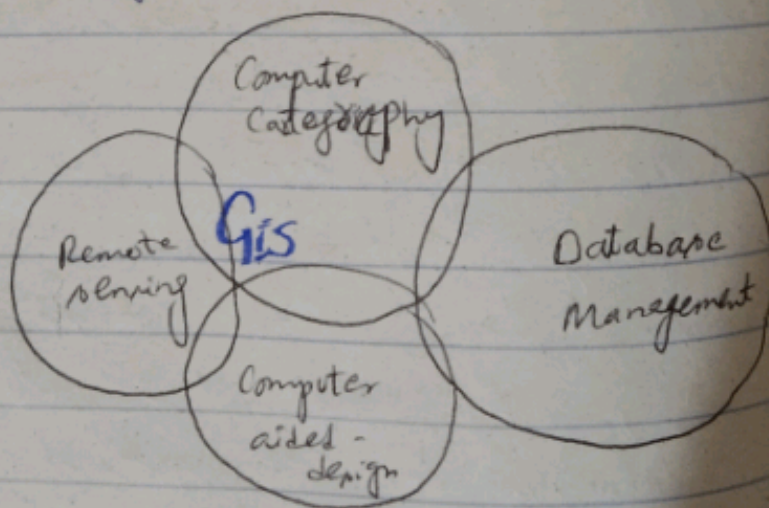
The Kyoto protocol was succeeded by Paris agreement in 2015.

# (C) GIS

## Geographic Information System

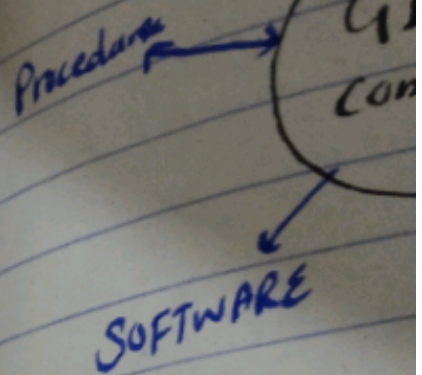
"It is an organized collection of computer software, hardware, geographic data and personal designs to efficiently capture, store, analyze and display all form of geographically referred information"

GIS has proved as an integrating technology



### Components of GIS:

- 1) Hardware
- 2) Software
- 3) Data
- 4) Procedure

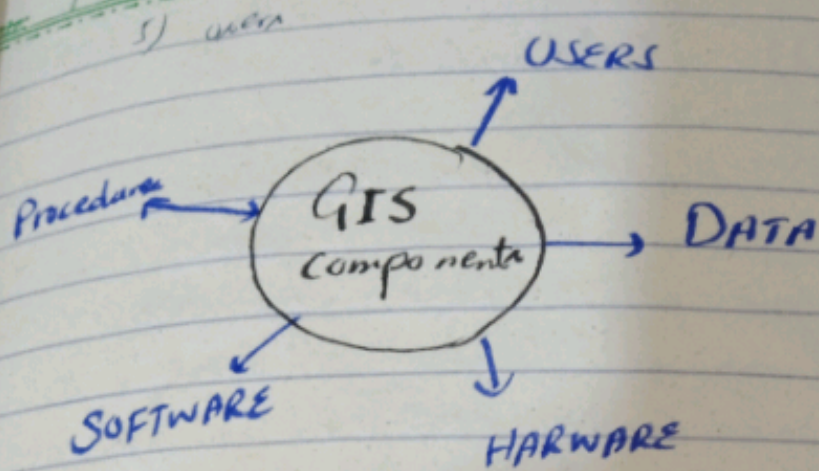


GIS Tasks:-

Systems:

- (1) Input
- (2) Mani
- (3) Mana
- (4) Que
- (5) Visual

GIS provides geographical information. It has uses in monitoring, mapping, sector, education, employ GIS



GIS Tasks:-

GIS performs five tasks and

systems:

- (1) Input
- (2) Manipulation
- (3) Management
- (4) Query and Analysis
- (5) Visualization

GIS provides powerful tools for addressing geographical and environmental issues.

It has wide range of uses in monitoring, measuring, modeling mapping and management. Healthcare sector, education, research institutes employ GIS for policy, planning and monitoring.

Date: 1/20

## (D) Antioxidants

"Antioxidants are the compounds that help the body to protect from damage caused by free radicals."

They neutralize the free radicals and reduce the oxidative stress which can prevent the cell damage and lower the risk of chronic diseases such as heart disease, cancer and age-related condition.

Types:- Common (nutrients) anti-oxidants include Vitamins C and E, Selenium, plant based compounds like flavonoids and polyphenols.

### Advantages of Anti-oxidants

- (i) Reduces oxidative stress
- (ii) Prevents chronic diseases
- (iii) Boosts immune system
- (iv) Support skin health
- (v) Improve the activity of body

Date: 1/20

### Disadvantages of

- (i) Excessive intake
- (ii) May lead to risk of
- (iii) May lead to compromise
- (iv) Fat-soluble vitamins
- (v) if ca

SEL

Q: Not

I.C

Stands for "Intell

IQ is pro  
intellect of  
the boy  
he ca  
the

## Disadvantages of anti-oxidants

- i) Excessive intake can increase the risk of cancer and kidney diseases.
- ii) May lead to nutritional compromise due to overuse of multivitamins.
- iii) Fat-soluble anti-oxidants like vitamin E builds up toxicity if used in large amounts.

## SECTION - II

Q: No 7

I.Q

- Stands for "Intelligence Quotient"

• IQ is property of the intellect of a person on the basis of which he can analyze the problems effectively.

E.Q

- Stands for "Emotional Quotient"

• EQ is the ability of a person to exhibit discernment and critical analysis in daily life.

• IQ often regarded as "class smart"

• EQ often regarded as "street smart"

• IQ is necessary for a person to perform well in the arena of education because it relies on how the person remembers and analyses the problems.

• EQ is necessary to survive in the society while maintaining a sustainable relations with the society without being manipulated or used.

b) Given Data:-

The present age of Aman = ?  
if

After 20 years his age will be 10 times of his age 10 years back.

Solution:-

Let, the present age of Aman =  $x$

His age 10 year before present age =  $x - 10$

Age 20 year after =  $10(x - 10)$

His age after

$$\begin{aligned}
 x + 20 &= \\
 x + 20 &= \\
 10x - x &= \\
 \frac{9x}{9} &= \\
 x &=
 \end{aligned}$$

Aman's age at

(c) Given data

Peter can  
John can

Time th  
now the

Solution:-

Peter can  
John

Rate of mow

$$= \frac{1}{9}$$

His age after 20 years =  $x + 20$

$$x + 20 = 10(x - 10)$$

$$x + 20 = 10x - 100$$

$$10x - x = 100 + 20$$

$$\frac{9x}{9} = \frac{120}{9}$$

$$x = 13.33$$

Aman's age at present is **13.33 years**

(C) Given data

Peter can mow = 40 min

John can mow = 60 min

Time they will take to  
mow the lawn together = ?

Solution:-

Peter can mow lawn in one minute =  $\frac{1}{40}$

John can mow lawn in 1 min =  $\frac{1}{60}$

Rate of mowing lawn by both =  $\frac{1}{40} + \frac{1}{60}$

$$= \frac{1}{40} + \frac{1}{60}$$

$$= \frac{30 + 20}{1200} = \frac{50}{1200} =$$

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$$= \frac{12 \text{ of } 5}{5} = \boxed{24 \text{ min}}$$

Ans

(d) Given Data

Multiplies a number = x  
by  $\frac{3}{5}$  instead of  
 $\frac{5}{3}$

calculated the percentage error = ?

Solution:-

Let

The number is = x

$x \times \frac{3}{5}$  = incorrect calculation

$x \times \frac{5}{3}$  = correct calculation

∴ Error is the difference b/w  
Correct & incorrect results

$$\therefore \text{Error} = (x \times \frac{5}{3}) - (x \times \frac{3}{5})$$

$$= x \left( \frac{5}{3} - \frac{3}{5} \right)$$

$$= x \left( \frac{25-9}{15} \right)$$

$$= x \left( \frac{16}{15} \right)$$

$$\therefore \text{Error} = \frac{\text{Error}}{\text{Correct}} \times 100$$

$$= \frac{x \left( \frac{16}{15} \right)}{x \left( \frac{5}{3} \right)} \times 100$$

$$= \frac{16/15 \times 100}{5/3}$$

$$= \frac{16 \times 3 \times 100}{15 \times 5}$$

$$= \boxed{64}$$

Question:

(a) Given Data:

Width  
rectangle

if length

Room's

Solution:-

Width

Length

60% of length

Width  
of room

Dimension



$$= \frac{16/15}{5/3} \times 100$$

$$= \frac{16 \times 3}{15 \times 5} \times 100 = \frac{48}{75} \times 100$$

$$= \boxed{64\% \text{ Error}}$$

Question: No 8

(a) Given Data:

Width of a rectangular room = 60% of its length  
if length of classroom = 15ft

Room's dimensions = ?

Solution:-

Width of room = 60% of length

Length = 15ft

$$60\% \text{ of length} = \frac{60}{100} \times 15 = 9$$

Width = 9 meter, feet  
of room

Dimension of room: length = 15ft

Width = 9ft

Dimension of room are  $\boxed{15 \text{ ft by } 9 \text{ ft}}$

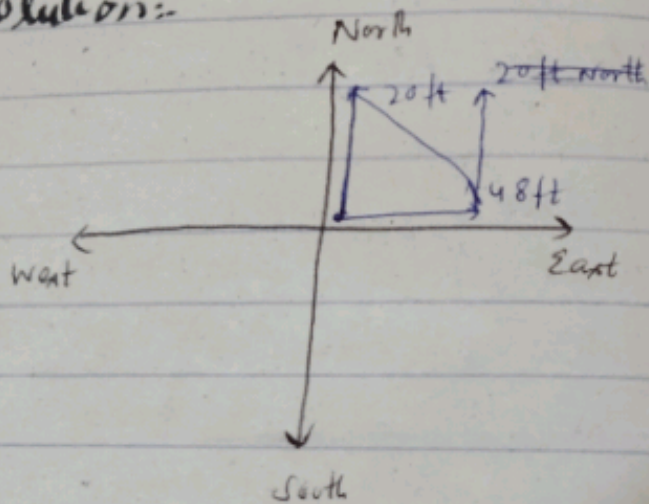
Date: 1/20  
(b) Girls Data:

Veena ran = 48ft in East

Ran in north = 20ft

From where she started and how far she has run = ?

Solution:



According to pythagorean theorem

$$(\text{Hyp})^2 = (\text{Alt})^2 + (\text{Base})^2$$

$$= (48)^2 + (20)^2$$

$$= 2304 + 400$$

$$= 2704$$

$$\sqrt{(\text{Hyp})^2} = \sqrt{2704}$$

$$= \boxed{52 \text{ feet}}$$

She would have run 52 feet straight.

(c) Given data  
Average marks of the marks of a were 85  
Average

Solution: Average

52.15

Sum of marks of students

Marks of a

New average

Average

Given data

(c) Average marks of 40 students = 52.15

The marks of a student

were 85 instead of 49.

Average marks = ?

Solution:

$$\text{Average marks} = \frac{\text{Sum of marks of all students}}{\text{no. of students}}$$

$$52.15 = \frac{\text{Sum of marks of all students}}{40}$$

Sum of marks of all student

$$= \frac{40 \times 52.15}{100}$$

$$= \boxed{2086}$$

Marks of a student were 49 instead

of 85.

New average = ?

$$= 2086 - 49 + 85$$

$$= 2122$$

$$\text{Average} = \frac{\text{Sum of marks}}{\text{No. of students}}$$

$$= \frac{2122}{40}$$

$$= \boxed{53.05}$$

The new average = 53.05

Date: 1/10  
(d) Given Data:-

Vegetable Pizza liked by = 37 people  
Chicken pizza " = 25 people  
None liked by = 3 people

A person was randomly asked for choice  
calculate probability = ?  
to like chicken pizza

Solution:-

Probability =  $\frac{\text{No. of ways of occurrence of an event}}{\text{Total possible outcomes}}$

$$= \frac{3}{3} = \boxed{1}$$

No. of people likes Pizza =  $37 + 25$   
= 62

3 likes neither =  $62 + 3 = 65$  people

=  $\frac{\text{No. of people who liked chicken pizza}}{65}$

$$= \frac{25}{65} = \frac{5}{13} = \frac{5}{13} \text{ is Probability}$$