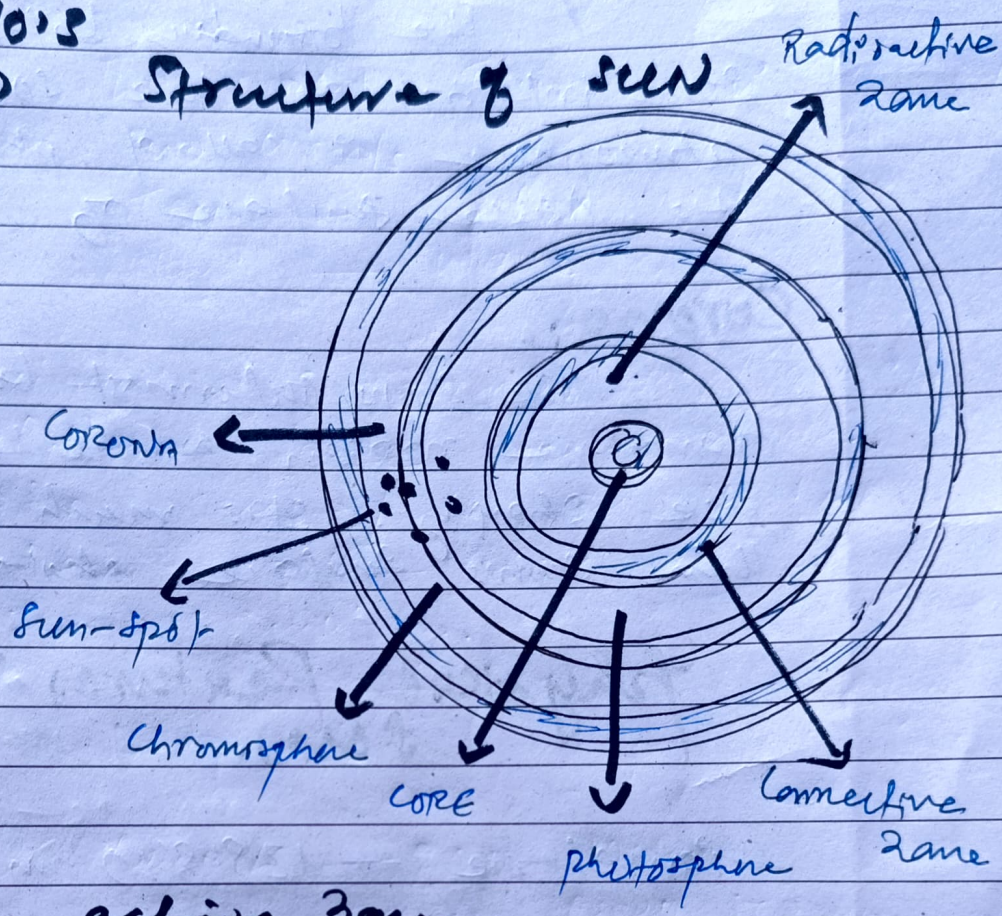
Date

Lecture 1

Q# No 1

(a) Structure of sun



Radio-active zone.

This zone is between the core and convective zone and roughly 10% of sun's energy.

Convective zone.

The layer of the sun is above the radioactive zone. The temperature at the bottom of convective zone is above 2 million degree Centigrade

Date

Photosphere:
The boundary between the sun's interior and the solar atmosphere is called photosphere. It is visible surface of the sun.

Corona:
The sun's outermost layer - transition region, where temperature rise sharply. It is much hotter than sun's surface photosphere.

Physical Features of the sun.

Diameter — 1391940 km

Mass — 1.989×10^{30} kg

Density -

Sun is composed of 74% H_2, 24% Helium and 2% heavy metals on the basis of percentage of total mass.

Temperature at the core of the sun 15 million °C. OR 27m F. and temperature at the surface of the sun — 5500 °C.

Date

Q# 03
(B) Tsunami:

The word Tsunami is derived from two words

Tsu — Harbor
Nami — wave

Tsunami is a japanese word which defines — large ocean wave, waves caused by an under water earth — quick or volcanic eruption.

Characteristics

Wavelength — 200 — 100 km across — deep ocean.
Height upto — 30 meter

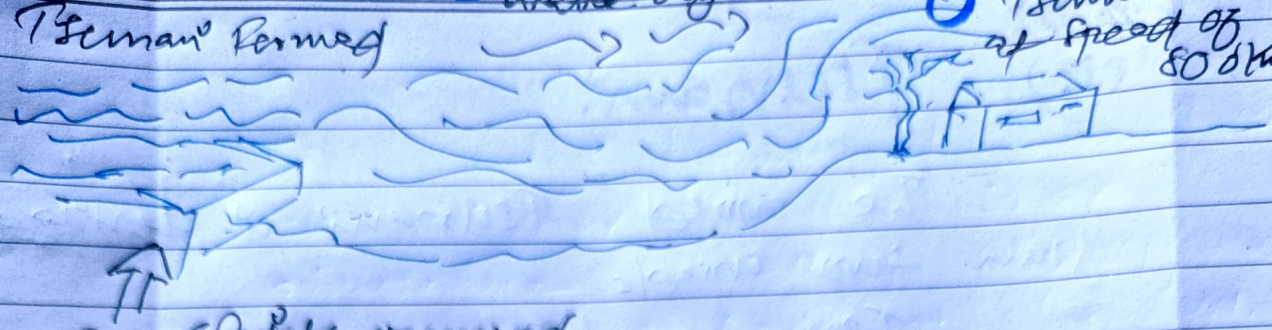
Causes:-

Earth Quicks
Landslides
Volcanic Eruption
nuclear Experiment.

(I) Tsunami Formed

(II) Large waves began

(III) Tsunami moved at speed of 800 km/h



The Quake occured in a region where two of the tectonic plate push together

Events :-

(I) North-Pacific Coast- Japan
- 11 March, 2011.
- Claimed 1800 lives
- Magnitude- 9.0

(II) Sumatra, Indonesia
- Magnitude
- 26 Dec, 2004.

(III) Alask (Landslides)
- 1958
-

Date

Q# 03

(c) # Environmental Pollution

Definition:-

Pollution is derived from latin word which means

↳ Pollvere

to contaminate any features of environment.

Environmental pollution is defined as the unfavourable alteration of our surroundings.

It changes the quality of air, water and land

Types.

- Air pollution
- water pollution
- Land - pollution

According to form in which they persist after release into the environment.

primary - Pollutants - Such as CO_2, CO and SO_2

secondary - pollutants

Formed when react with primary pollutants.

H_2SO_4 and O_3.

Date

Some Harmful Effects.

(i) Air-pollution.

Causes:- Emissions from industries, vehicles, burning fuel.

Effects:

- Respiratory Issues
- Acid - Rain
- Climate change
- Ozone - layer depletion.

(ii) Water pollution.

Causes:- Industrial discharge, agricultural Runoff, plastic waste.

Effects:

Damage Aquatic Ecosystem
Unsafe - drinking water
Disease like - cholera.

(iii) Land pollution.

Causes:- Pesticides, deforestation

Effects:

Reduced Soil Fertility
Harmful crops
Ground-water Contamination

Date

Measures to curb pollution

i) Waste-Management:-

- promote recycling and composting
- Adopting 3Rs principles
  Reduce
  Reuse and Recycling Methods.

ii) Afforestation:-

- plant more trees
- Improve air-quality
- combat soil erosion.

iii) Enforce Regulation:-

Implement strict laws for Industries to control emissions and waste disposal.

iv) public Awareness:-

- Educate people on the importance of reducing pollution
- Encourage community-led clean-up campaigns.

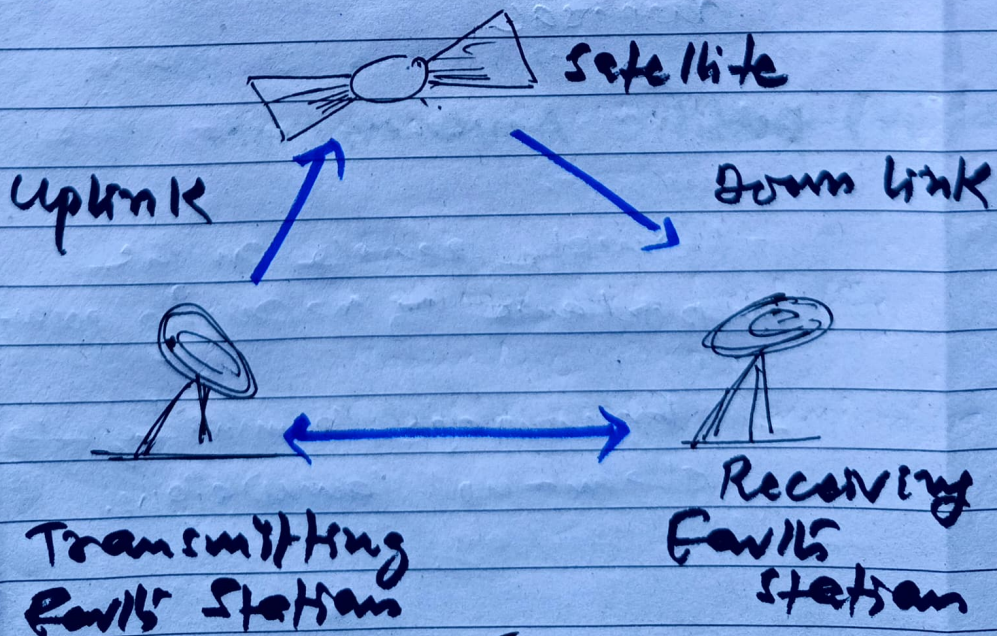
Date

Q#03 Wireless Communication

Wireless Communication is the transmission of information over a distance without using wires or cables. Instead, it uses electromagnetic waves such as
Radio
Infrared
Micro-wave signals to transfer data between links.

Working of Satellite.

A satellite acts as a relay station in wireless communication, receiving signals from a transmitter on Earth, and sending them to a receiver at another location.



Date

CELL

Q#05

Eukaryotic vs prokaryotic

Cells are often divided into different groups based on major characteristics.
Separate cells into two groups prokaryotic and Eukaryotic cells.

prokaryotic cell.

prokaryotic cells are fundamentally different in their internal organization from eukaryotic cells.

prokaryotic cell which includes bacteria and archaea, are the simplest cellular organisms.

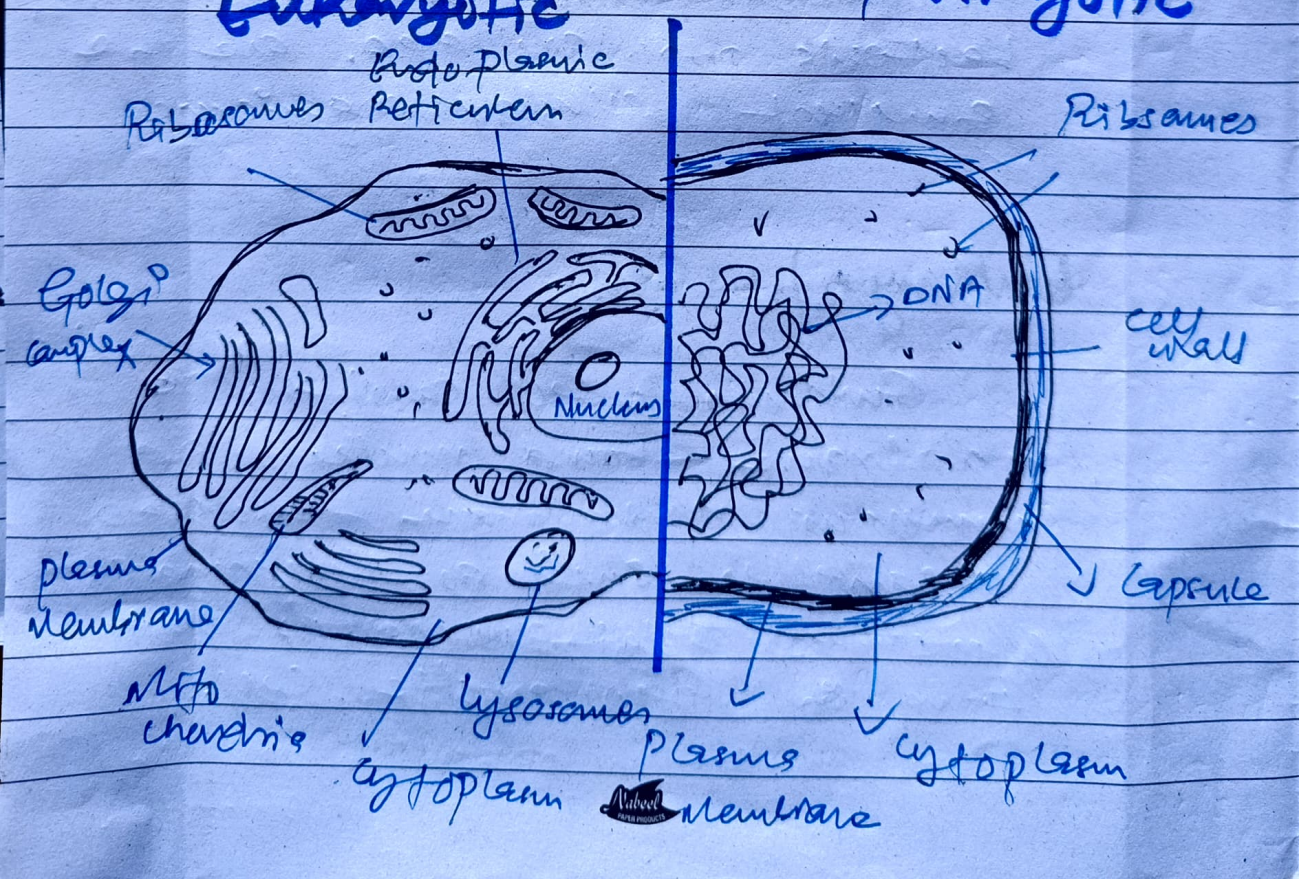
Eukaryotic cell.

Eukaryotic cell contains membrane-bound nucleus and numerous membrane-enclosed organelles such as Mitochondria, Lysosomes, Golgi-apparatus not found in prokaryotic cell.

Date

Differences.

	Prokaryotic	Eukaryotic
Definition	Cell without Nucleus	Cell with Nucleus.
Size	Small 1–10 µm	Larger 10–100 µm
Nucleus	Absent	present
Organelles	NO membrane bound organelles	Membrane bound organelles, ER, Golgi Mitosis and Meiosis Enclosed within Nucleus.
Cell-Division	Binary Fission	
[redacted] structure	Free floating in cytoplasm	
DNA	Small (70s)	Larger (80s)
Ribosomes	Bacteria and Archaea	plants, animals Fungi, protists.
Examples.		



Date

Q. No: 5
(B)

Global Warming

Global warming refers to the gradual increase in the Earth's average temperature due to accumulation of green house-gases (GHGs) like CO_2, CH_4 and N_2O in the atmosphere.
These gases trap heat from the sun, leading to climate change.

Causes:-

⇒ Burning of Fossil-Fuel
Release CO_2 from coal.

⇒ Deforestation
Reduce carbon sequestration by trees.

⇒ Industrial activities.
Emit GHG like CH_4 and N_2O.

⇒ Agriculture.
Live-stock and paddies release CH_4.

Effects:-

- Rising sea level
- Extreme whether events
- Loss of bio-diversity and habitate - destruction
- Impact on agriculture and water resources

Date

Kyoto Protocol.

The Kyoto - protocol is an international treaty adopted in 1997 in Kyoto - Japan, under the United Nations Framework Convention on Climate change (UNFCCC).

It aims to reduce Greenhouse-Gases (GHGs) emissions and combat global-warming.

Features:-

(i) Binding Targets:- Developed nations committed to reduce (GHG) emission by an average of 5% below 1990 levels during the first commitment period (2008-2012).

(ii) Flexible Mechanisms:-

1) Carbon Trading :- Countries can trade emission allowances.

ii) Clean Development Mechanism (CDM). Investment in emission-reduction projects in developing countries

iii) Joint Implementation:- Collaboration between developed countries on emission reduction projects

Date

(iii) Ireland-Taoiseach Enda Kenny proposed:- Extended by the John-Agreement- (2013-2020), though not unnecessarily satisfied.

Q#05 (c) G.I.S

A Geographic Information System (GIS) is a framework for gathering, managing, analyzing and visualizing spatial data, and geographic data as well. It integrates data from various sources to provide insights into patterns, relationships, and trends across different geographical locations.

Components:-

(i) Hardware
(ii) Software
(iii) Data
(iv) People
(v) process

G.I.S

Date

(i) Hardware :-
Including Computer, GPS and other tools used for data storage, analysing and mapping.

(ii) Software :-
GIS like ArcGIS, QGIS or Google Earth for map creation.

(iii) Data :-
Comprising spatial data (location based)
Attribute data (Descriptive Information)

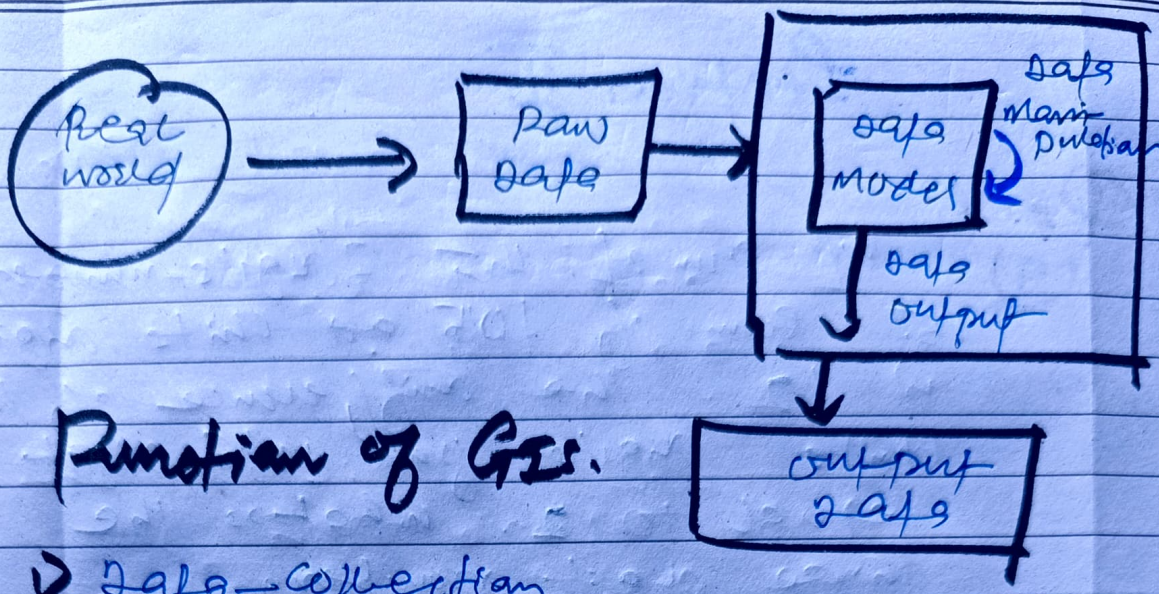
a) Raster data :-
Images (satellite photos)

b) Vector data :-
points, lines, and polygons representing features like cities, roads and boundaries.

(iv) People :-
who analyze data and create applications to solve real-world problems.

(v) Process :-
Methods and work-flow used to analyze data and derive insights.

Date



Function of GIS.

i) Data collection
ii) Data storage
iii) Data analysis
iv) visualization
v) Decision making

Application:-

- Urban planning
- Environmental Management
- Disaster Management
- Transportation
- public health
- Agriculture.

Date

Section II

Q#06

(g) If sum of the 3 digits number is 15. If sum of 10's and unit's digits is 12. The difference of the unit's digits from 10's digit is equal to 2. what is the three digit number.

Three digit Number.

(i) $A+B+C = 15$

Hundreds digits — Tens digit — Unit digit.

(ii) $B+C = 12$

(iii) $B-C = 2$

Now:-

$B-C = 2$

$B = C+2$

$B+C = 12$

$C+2+C = 12$

$C = 5$

C = 5

Date

B = C + 2

B = 5 + 2 = 7

B = 7

We know that

A + B + C = 15

A + 7 + 5 = 15

A = 15 − 12

A = 3

A = 3

Three Digits Number.

375.

Q#06

(B)

Ratio of their slices - 2 : 3 : 4

Total slices - 18

weight of each slices - 40 gram

prices of small size - 320

Date

let

The Number of small, Medium and large slices.

$2x, 3x, 4x$

$2x + 3x + 4x = 18$

$9x = 18$

$x = \frac{18^2}{9} = \boxed{x = 2}$

small — $2x = 2 \times 2 = 4$

Medium — $3x, \; 3 \times 2 = 6$

large — $4x, \; 4 \times 2 = 8$

weight:-

small - $4 \times 40 = 160$ gram

Medium — $6 \times 40 = 240$ gram

large — $8 \times 40 = 320$ gram.

Total weight:

$160 + 240 + 320 = 720$ gm.

Prices:

small — $\frac{320}{160} = 2$ per gram.

cost per gram.

Medium 240×2

480

large — 320×2

640

Date

Q#6

(c) Diameter of a circle is 6cm. Find circumference and area of circle.

Solution:

We know that

$C = 2\pi r$

$\because Dia = 2r$

$Area = \pi r^2$

$Circumference = 2\pi r$

$\Rightarrow 2 \times 3.14 \times 3$

$\boxed{C \Rightarrow 18.85 cm}$

$Area = \pi r^2$

$\Rightarrow 3.14 \times (3)^2$

$\Rightarrow 3.14 \times 9$

$\boxed{A \Rightarrow 28.27 cm^2}$

Date

Q#06

(a) Identify the missing

i) 13, 24, 46, 90, 178 — — —?

ii) 5, 6, 9, 14, 21 — — ?

i) 13, 24, 46, 90, 178

Solution:

24 − 13 = 11

46 − 24 = 22

90 − 46 = 44

178 − 90 = 88

The difference approximately double each time

predict the next difference

88 × 2 = 176

add the difference to the last term. (178)

178 + 176 = 354.

Date

Q#06
(iii)

ii) 5, 6, 9, 14, 21 ..?

Solution:

6 - 5 = 1
9 - 6 = 3
14 - 9 = 5
21 - 14 = 7

The difference increase by (+2) each - time

So.

7 + 2 = 9

Add this difference to the last term term (21)

9 + 21 = 30.

So, The Missing term is 30.

Date

Q#08.

(a)

Data:

Length of room = 15ft

width of the room = 60% of the length

So, width of the room.

$= 0.60 \times \text{length}$

$= 0.60 \times 15 = 9ft$

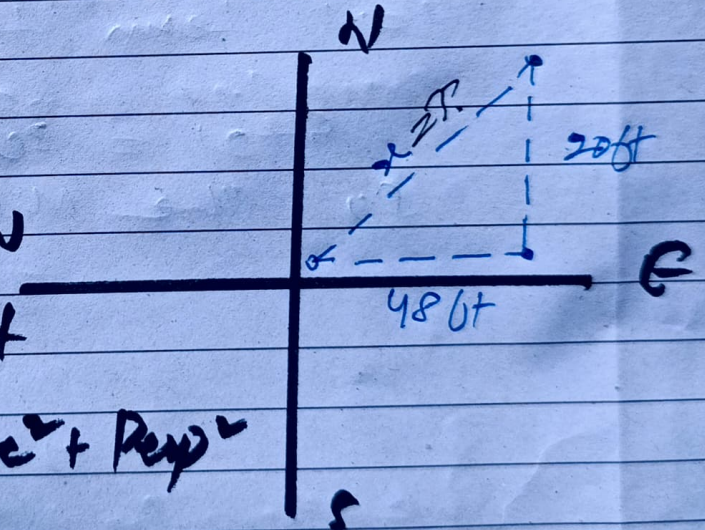
Rooms dimentions.

length = 15ft

width = 9ft.

Q#08

(b)



we know that

$Hyp^2 = Base^2 + Perp^2$

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

$\Rightarrow \sqrt{2304 + 400}$

$= \sqrt{2704}$

$\Rightarrow 52ft$

So, if keene had run straight to the water station, she would have run 52ft.

Date

Q.08

(c)

$$\text{Average} = \frac{\text{Total}}{\text{No:}}$$

Initial Marks = Average × No: of students

$\Rightarrow 52.15 \times 40$

$\Rightarrow 2086$

Marks of one student were taken 49 instead of 85.

So,

Corrected marks = $2086 - 49 + 85$

$\Rightarrow 2122$

$$\text{Corrected Average} = \frac{\text{Total Marks.}}{\text{No: of students}}$$

$$\Rightarrow \frac{2122}{40}$$

$\Rightarrow 53.05$

The corrected average marks of the class = 53.05.