

PART-IISECTION-I

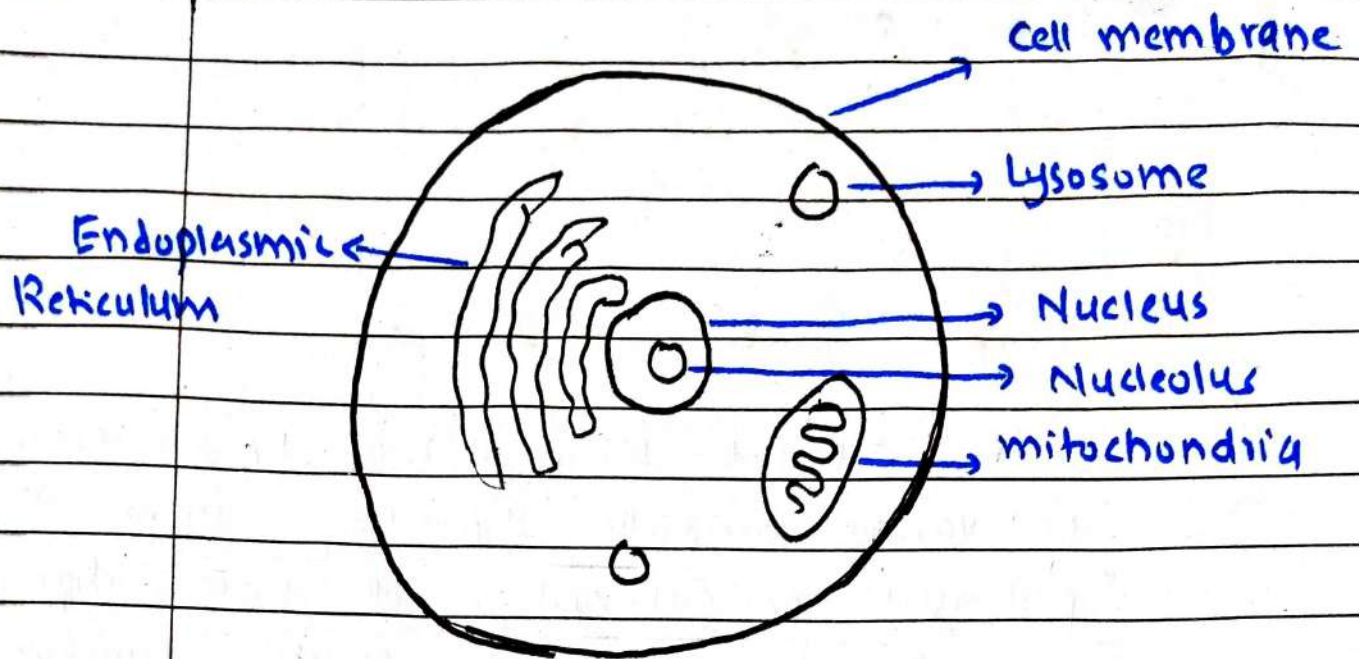
Q3.

a. Why cells form organelles?

Cell is the basic unit of life. It consists on various organelles depending upon prokaryote or eukaryote. Cells form different organelles that perform specific functions inside the cell. A true eukaryotic cell consists of following organelles:

- (1) Ribosomes
- (2) Chloroplast
- (3) Mitochondria
- (4) Endoplasmic Reticulum
- (5) Nucleus
- (6) Lysosomes
- (7) Cell membrane

For instance, a cell requires ribosomes for protein synthesis, mitochondria as a power house of cell, chloroplast for photosynthesis, lysosomes for phagocytosis of food and waste material removal etc.



Structure of an animal cell

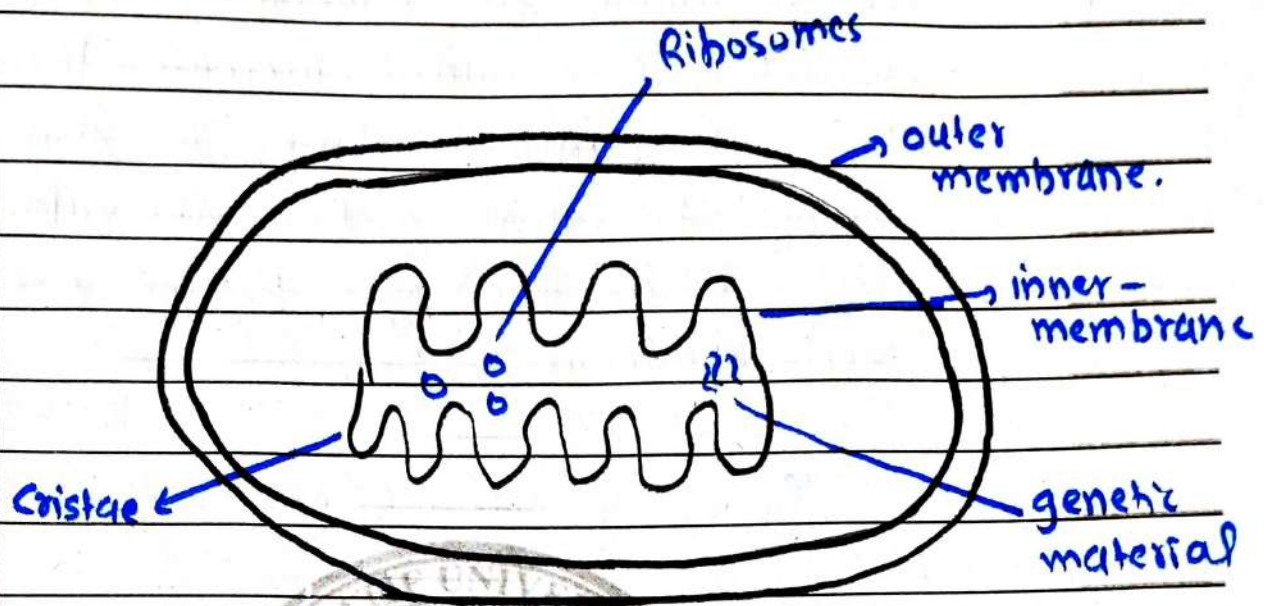
Mitochondria In Human cell

Mitochondria is a double-membrane organelle present in both plant cell and animal cell. It consists of central finger-like structures called cristae. Between the two membranes, inter-membrane space is present.

Function of mitochondria:

Mitochondria is called "the power house of cell" because it generates Adenosine Tri-phosphate (ATP) from glucose, fructose etc. ATP is an energy currency that can be

used for different functions in the body.



Structure of Mitochondria

(b)

Doping

Defination: Doping is the phenomenon of adding impurities in the semi-conductors to increase their property of conductivity of heat and electricity.

Explanation: As metals are good conductors of electricity and non-metals are bad conductors of electricity. On the other hand, metalloids can be both depending

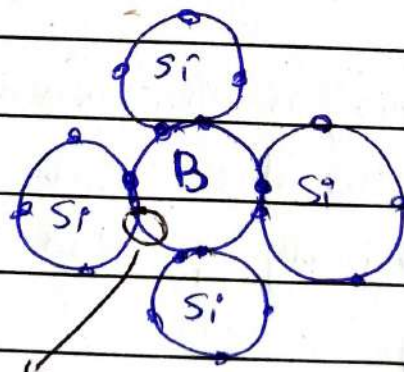
upon presence of impurities in it. Pure form of metalloids are non-conductors. However, impurities, when added, increase their conductivity. For such purpose, doping is done. In doping, tri-valent and penta-valent atoms are added, forming P-type and N-type semi-conductors.

Types of semi-conductors

There are two types of semi-conductors.

(i) P-type semi-conductor

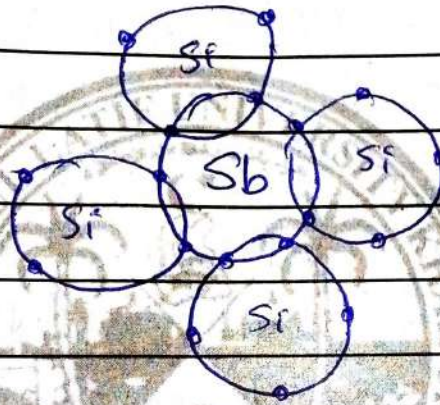
In this type of semi-conductor, a trivalent impurity is added to the non-conductor. For instance Boron (B) is a trivalent atom added to semi-conductor like Silicon, Germanium.



The above diagram shows acceptor impurities which moves and increase conductivity of the semi-conductor.

(ii) N-type semi-conductor

In this type, there is doping of pentavalent atom such as Antimony (Sb) with impurities like Silicon, Germanium (Ge). The extra-electron will be free that plays role in conductivity of electricity.



In above diagram, donor impurity will serve as conductor. This type of semi-conductor is called N-type-semi-conductor.

(c)

Volcanic Eruption

Volcanic eruption is the sudden release of hot liquid (magma or lava) from the earth's surface due to excessive accumulation of heat or stress in the tectonic plates.

(i) Merits of volcanic eruption

- a. Near the volcanoes, large amount of energy in the form of heat is deposited. This accumulated energy can be converted into electricity called geo-thermal energy.
- b. Volcanoes can be the site of tourist attractions, thereby proving beneficial for economy of the state.
- c. Various types of landfills are formed after volcanic eruption.
- d. Ash released from volcano can be used as fertilizer.

(ii) Demerits of volcanic eruption

- a. Following are listed some of the demerits of volcanic eruption
- q. Volcanic eruption release large amount of harmful gas that can produce air

pollution. It release CO , CO_2 , SO_2 , HCl , hence, increasing temperature of the atmosphere.

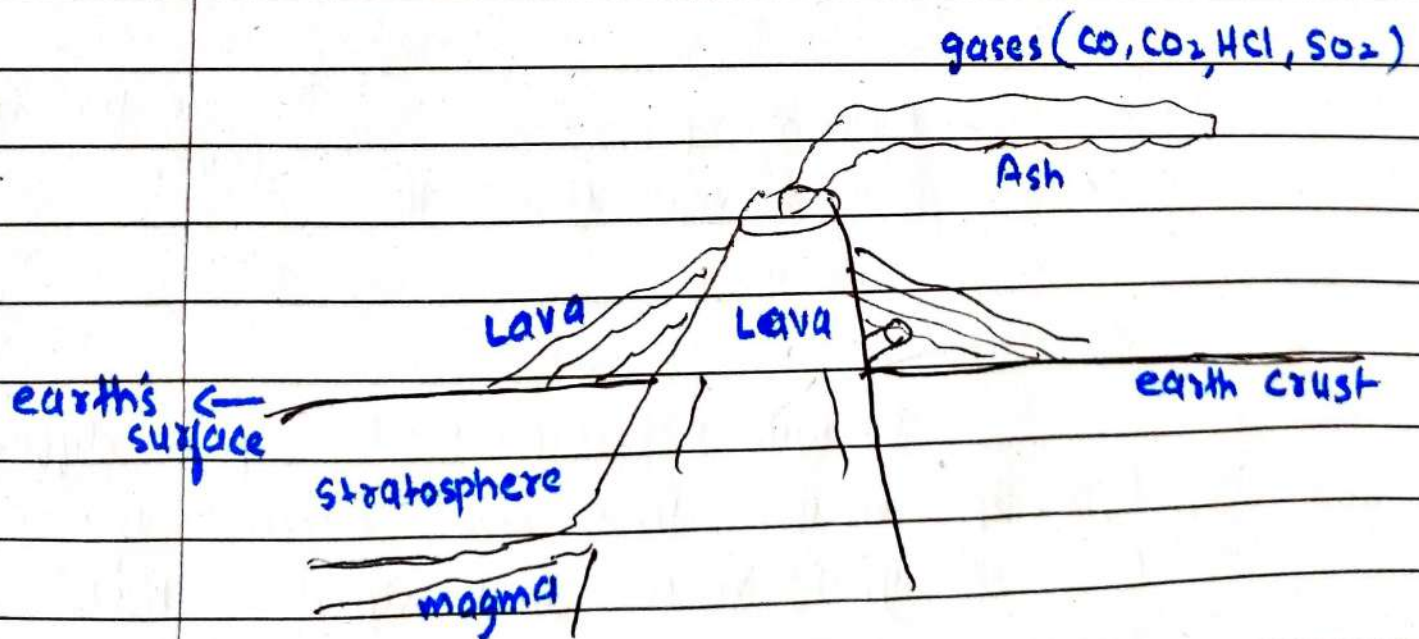
b. Sudden volcanic eruption can harm neighbouring infrastructure and even kill humans, animals and other living organisms.

c. Volcanoes can block sunlight rays reaching the earth, suddenly lowering temperature of the earth.

d. Volcano can damage vegetations and crops, affecting land fertility.

e. Harmful gases released from volcano can produce respiratory problems and worsen allergic diseases like asthma, and bronchitis.

f. Volcanoes can initiate other disasters, such as earthquake, Tsunami, landslides etc.



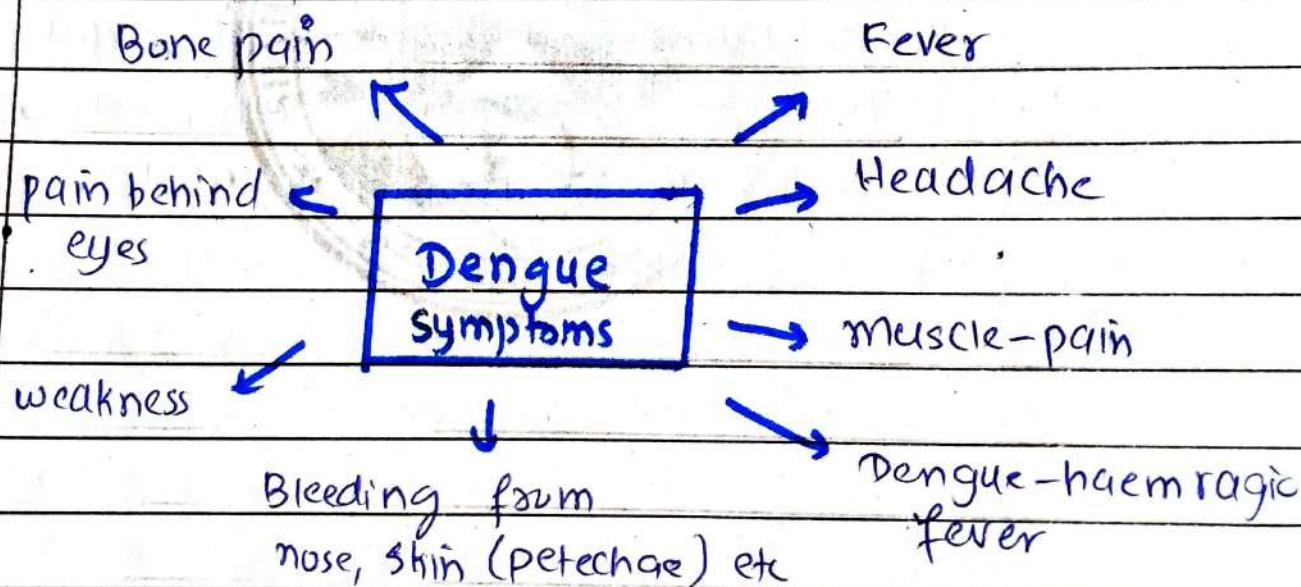
Volcanic Eruption

(d)

Dengue

Dengue is an infection caused by *Aedes aegypti* mosquito. This mosquito carries a virus inside. When female mosquito sucks blood from human, it transfers dengue virus into the body. It is an arthropod-borne infection that produce following symptoms:

Symptoms of dengue



Causative agent of dengue

Dengue is caused by five different types of viruses. They are carried by *Aedes aegypti* ~~virus~~ mosquito that transfers it into human body by sucking blood. Each type of virus differs in

its severity.

Remedies for dengue infection

Dengue fever requires symptomatic treatment only. There is no antibiotic, anti-viral or vaccine for dengue virus. Patient is advised to take anti-pesticides, painkillers, multi-vitamins and adequate food and water. Diet should be high in nutrients including fruits and vegetables. Additionally, in severe cases, patient may need platelet transfusion. Otherwise, dengue fever recovers on its own with symptomatic treatment.

Prevention of dengue

- a. People ^{should} use nets for mosquitoes outside.
- b. windows and doors should be shut especially in evening time to prevent mosquitoes enter into home.
- c. Use of sprays to kill mosquito.
- d. Don't store water inside home because in stored water dengue is produced.

Q5.

(a)

Population explosion in Pakistan

Pakistan is a fifth most populous country in the world and second most populous in South Asia. Current population, according to Economic Survey of Pakistan, is 241.5 million and it is increasing rapidly at the rate of 2.5%. Each year almost 15 lac people are added into it, making it one of the fastest growing rate in the world.

(i) Causes of population explosion in Pakistan

- a. Early marriage of girls in majority areas of Pakistan
- b. Lack of awareness about family planning
- c. Religious dilemma about contraceptive use
- d. Lack of education about contraceptive use.
- e. Education is not a priority ~~in~~, especially in alienated areas.
- f. Higher rate of illiteracy, especially in women
- g. Lack of political will, about controlling measures, in higher authorities

(ii) Measures to control population explosion in Pakistan;

- a. There should be awareness campaigns regarding family planning and use of contraceptives.
 - b. Education of girls should be prioritized
 - c. Government should ensure implementation of laws regarding marriage age
 - d. Religious scholars should integrate to raise awareness regarding true Islamic teachings and eliminate myths from the society.
 - e. The government must invest on human development and education to raise both literacy rate and informed citizens in the society.
 - f. Leadership must ensure ^{adequate} campaigns and policies to control population of Pakistan.
- ✓

(b)

Remote Sensing

Remote sensing is the detection of different structures and patterns on earth's surface without coming in direct contact with the macro-structures. In this procedure, radiations are emitted from some source, such as sun or radar. These rays when hit the surface of earth and reflected back, their energy and frequency is analyzed to map shapes, sizes and properties of the target at distant points.

(i) Principles of remote sensing

(1) Emission of radiations from light source such as radar, sun



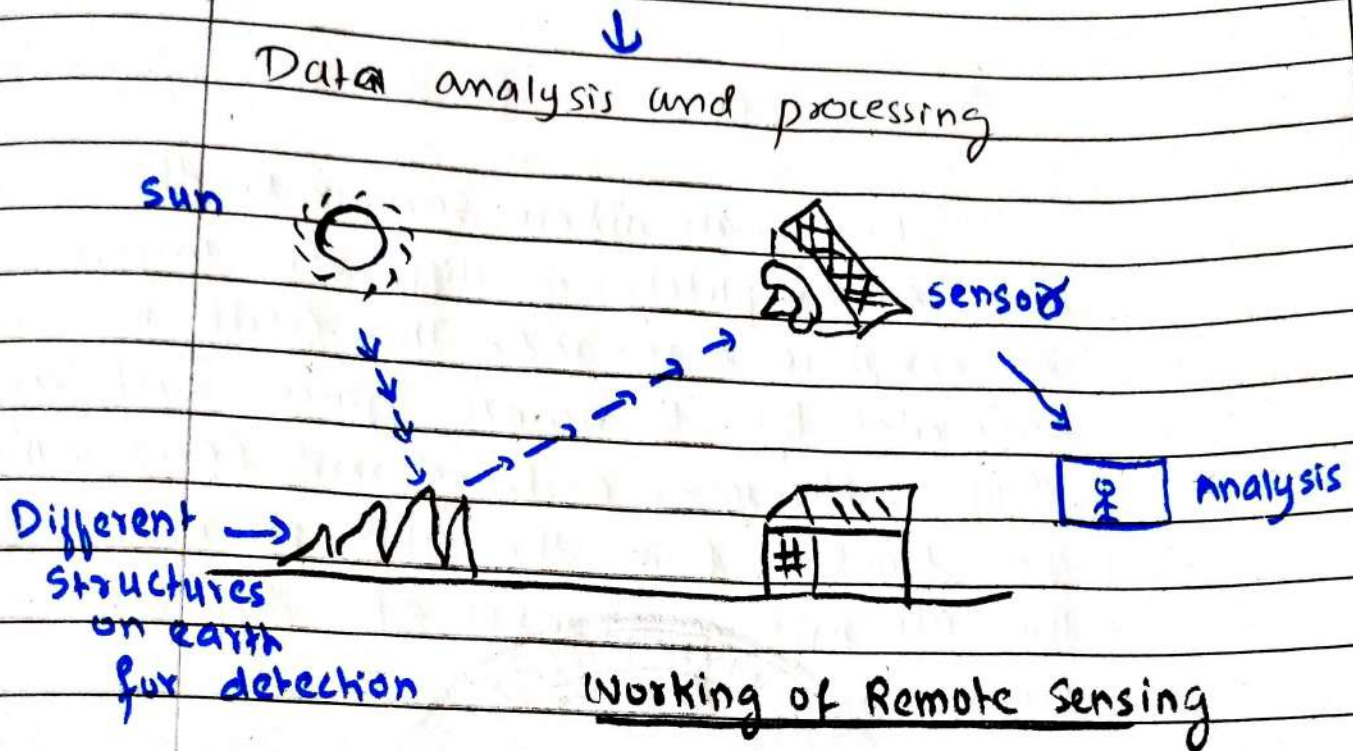
(2) Interaction of rays with the environment



Interaction of radiation with the target target may be oceans, deserts, mountains, forests etc



Detection of frequency and energy of reflected ray



(ii) Role of GIS in Environmental science

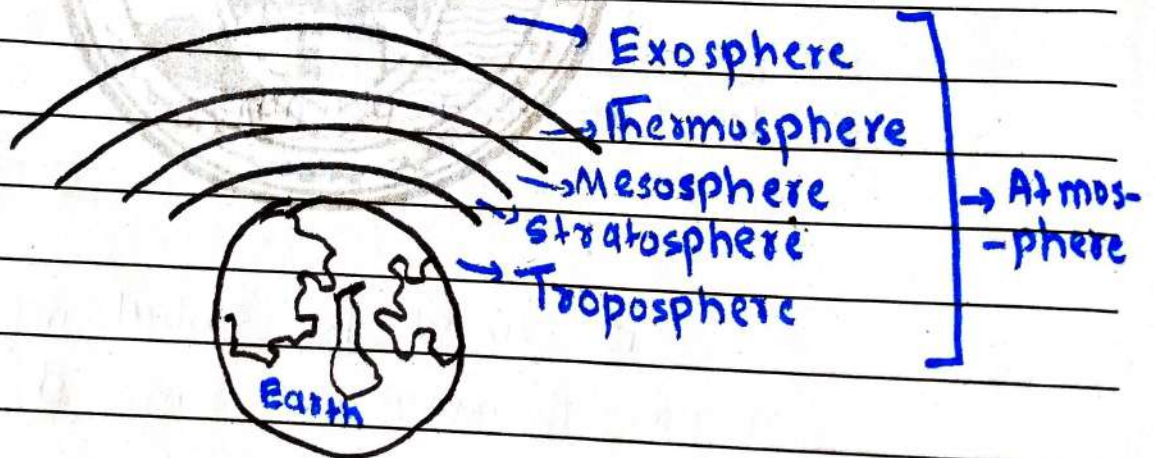
GIS stands for global information system. It uses information from different source, process and analyze them and forms 3D and 2D images of that system. Its role in environmental ~~sys~~ science given below:

A. Weather forecasting, traffic management, pollution control, Disaster management, Urban planning, precision farming etc.

c.

The Atmosphere is the Blanket of Earth

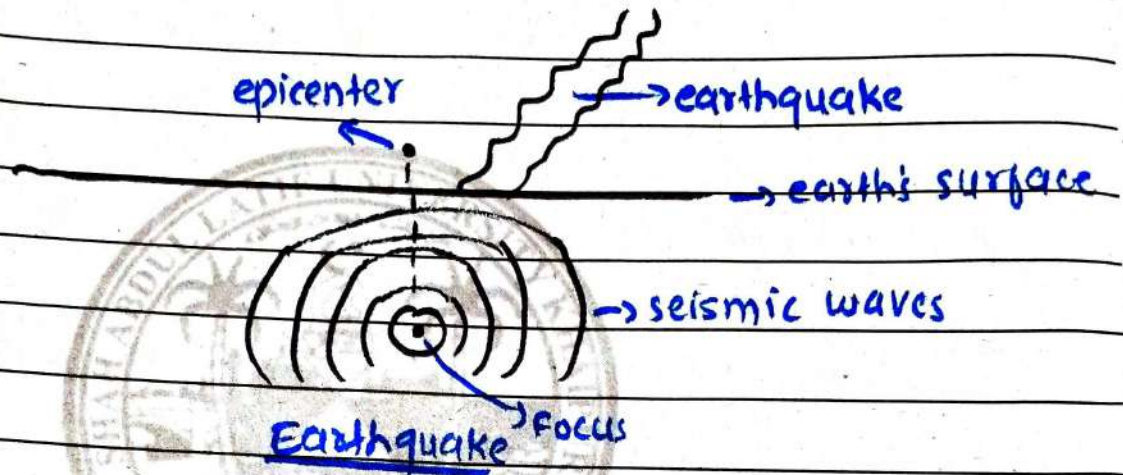
As the atmosphere surrounds the earth ~~for~~ completely in different layers till exosphere is reached. The earth is surrounded by ~~the~~ various gases such as Oxygen, Nitrogen, carbon dioxide (CO_2). These gases together form the atmosphere. The atmosphere consist of different layers given below:



The above figure shows how different layers of atmosphere surround the earth as blanket of earth.

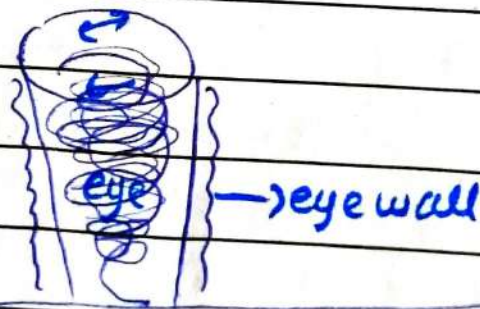
d.

(ii) Epicenter; It is the point directly above the focus in an earthquake.



(i) Hydrometer; It is used to measure pressure of water in any aquatic surface.

(iii) Eye wall of cyclone; It is the ring of intense thunderstorm surrounding the eye in a cyclone. Eye wall is the area with strongest wind speed in a cyclone.



cyclone

(V) Light Year : Light year is the unit of distance. It is the distance covered by light in time period of 1 year is called light year. It is measured in Angstrom ($\text{\AA}$).

SECTION-II

b.

Original price of camera = \$ 200

Off on camera = 25%.

tax on original price = 6%.

Total amount paid = ?

As total off on camera is 25% of 200 dollar

So,

$$25\% \text{ of } 200 = x \text{ (total off)}$$

$$\frac{25}{100} \times 200 = 50 \text{ Rs}$$

So total off on camera is 50 Rs

Then total tax on camera is 6% of 200 dollars

So,

$$6\% \text{ of } 200 = \text{total tax (y)}$$

$$\frac{6}{100} \times 200 = y$$

$$y = 12 \text{ Rs}$$

Hence, tax on camera is 6 Rs.

Adding, tax and total off

$$x + y = 50 + 12 = 62$$

Total amount paid ~~by~~ will be acquired
by subtracting the tax and sale price
~~Total price~~

Original price - Tax - sale price = Total paid

$$\text{Total paid} = 200 - 10 - 50$$

$$\text{Total paid} = 200 - 60$$

$$\text{Total paid} = 138 \text{ Rs} \quad \text{--- Ans}$$

c.

distance = 36 km

Velocity = 18 km/hr

started at = 1 pm

what time does it reach = ?

Ans velocity formula

$$V = \frac{S}{t}$$

Putting values of distance and velocity

$$18 \text{ km/hr} = \frac{36 \text{ km}}{\text{time}}$$

$$T = \frac{36 \text{ km}}{18 \text{ km/hr}}$$

$$T = 2 \text{ hr}$$

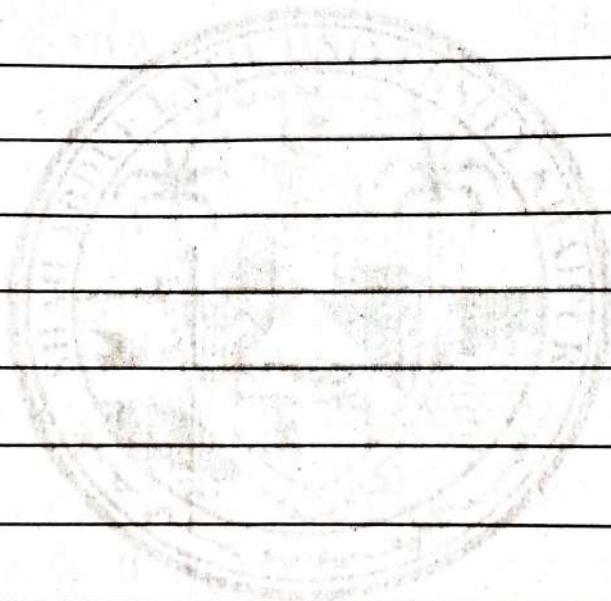
Hence, Braille will reach after 2 hours

at 3 pm.

d.

(i) STATISTICS

(ii) GAMBLER



a.

$$\text{diameter} = 14 \text{ cm}$$

$$\pi = 22/7$$

volume of sphere = ?

By using formula,

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

$$V = \frac{4}{3} \times \frac{22}{7} \times (14)^3$$

$$V = \frac{4}{3} \times \frac{22}{7} \times 196 \times 14$$

$$V = 11492.8 \text{ cm}^3$$

→ This is the volume of sphere.

b. b.

$$\text{Total saving} = 25000/\text{Rs}$$

$$\text{Ratio} = 1:2:3:4:5$$

$$\Rightarrow \text{Total Ratio} = 1+2+3+4+5 = 15$$

Smallest share = ?

By using ratio formula;

$$\text{Amount (share)} = \frac{\text{Total amount} \times \text{specific Ratio}}{\text{Total Ratio}}$$

Taking five friends as A, B, C, D, E

$$\text{Share(A)} = \frac{25000}{15} \times 1 = 1666.6 \text{ Rs}$$

$$\text{Share(B)} = \frac{25000}{15} \times 2 = 3333.2 \text{ Rs}$$

$$\text{share}(c) = \frac{25000}{15} \times 3 = 4999.8 \text{ Rs}$$

$$\text{share}(d) = \frac{25000}{15} \times 4 = 6666.4 \text{ Rs}$$

$$\text{share}(e) = \frac{25000}{15} \times 5 = 8333.3 \text{ Rs}$$

Hence, smallest share is that of A which is 1666.6 Rs.

C.

(i) 2, 6, 18, 54, 162, 486

By observing the pattern, all numbers are multiplied by 3. is the sequence;

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

486

Hence, all numbers are correct and there is no error.

(ii) 3, 5, 7, 11, 13, _____

By observing the sequence, all above numbers in the sequence are prime numbers. Hence next number should be 17.

The final sequence is 3, 5, 7, 11, 13, 17