

Part II

①

Section 1

Q4

(a)

Earthquakes=

The temporary trembling or shaking of land due to released of energy stored in it is known as earthquakes

Major Earthquakes in Pakistan=

- 5 October 2005
- 26 October 2015

How Earthquake is generate=

Earthquake is generated due to the movement of tectonic plates. There are total 15 tectonic plates upon which seven important are:

- North American plate
- South American plate
- Pacific plate
- Atlantic plate
- Indo-Australian plate
- Eurasian plate

Phenomenon beyond Earthquake generation=

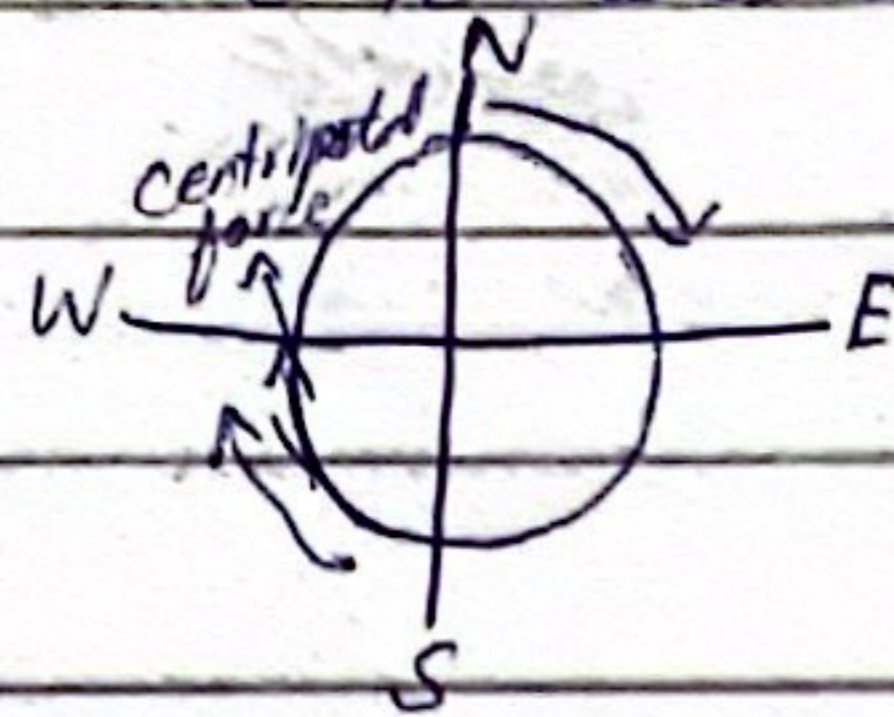
Earthquake is mostly generated due to lava extraction. When lava is extracted then earth's mass part is unbalance. During balance the tectonic

atomic bomb explosion. in the sea, high and strong waves can be generated in the ocean. Both destroyed all things and causes serious economic damages to the earth.

(b)

Coriolis Force=

When the object is moving right in northern hemisphere and moving left in southern hemisphere, then the force that is produced due to this movement is called coriolis force.



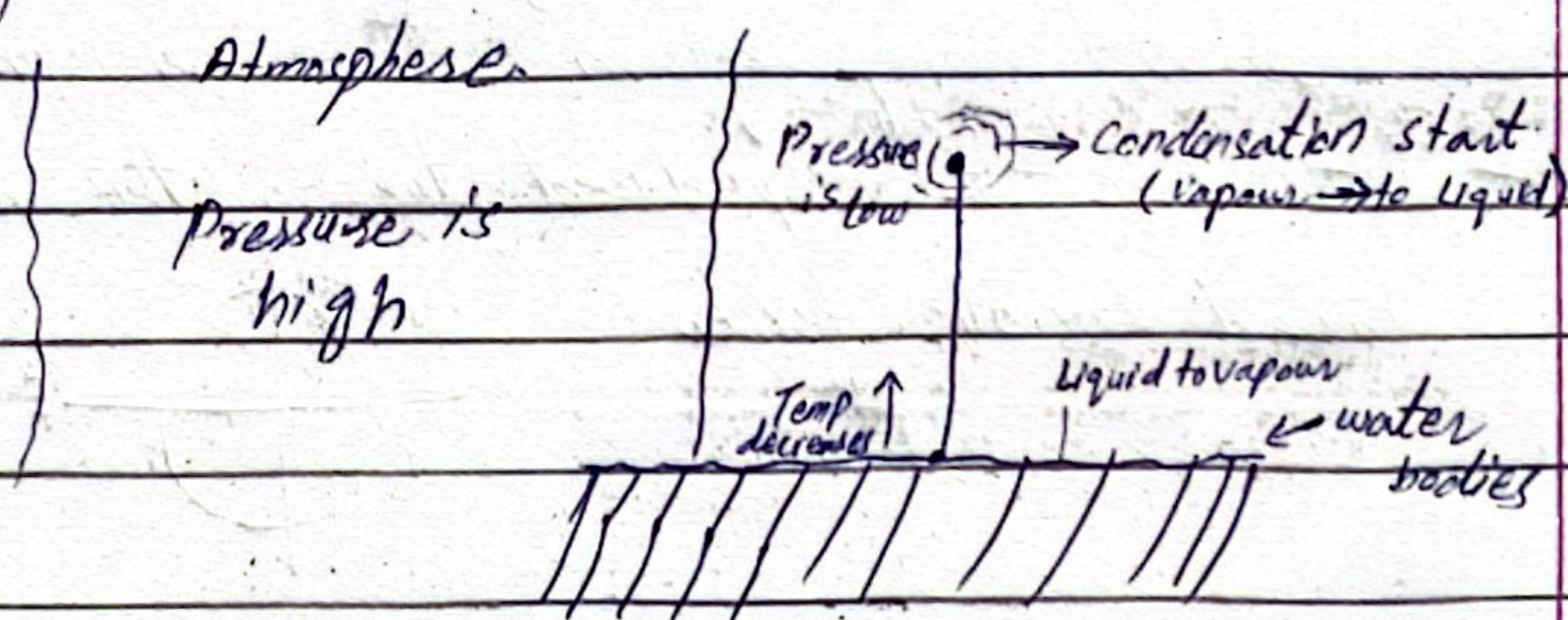
Hurricanes=

Hurricanes are the form of cyclone. Cyclone is produced when there is pressure difference is created and combined with coriolis force, then strong air circle is produced which is known as cyclone.

Generation of Hurricane (Cyclone)=

Cyclone is generated when pressure gradient is coupled with coriolis force. At the surface of

water bodies, the water drops are moving upward by decreasing temperature. After reaching the point where pressure is become low, condensation process is start. At that point pressure, on droplet from the atmosphere is high and itself pressure of droplet is low. Due to difference in pressure, pressure gradient is produced/generate. It is further coupled with the coriolis force, which move ⁱⁿ the cycle form.

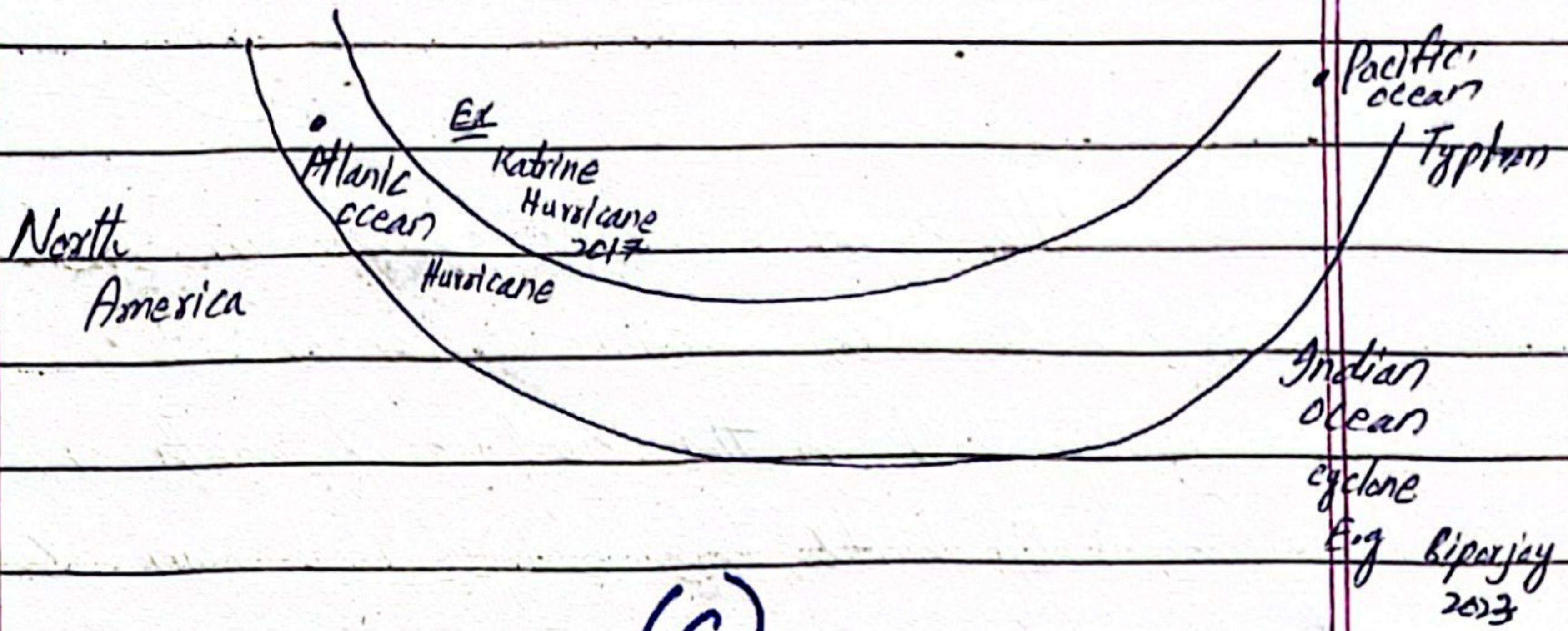


When this pressure difference is coupled with coriolis effect the large whole of cloud is generated in the sky above the ocean.

Parts of Cyclone (Hurricane):

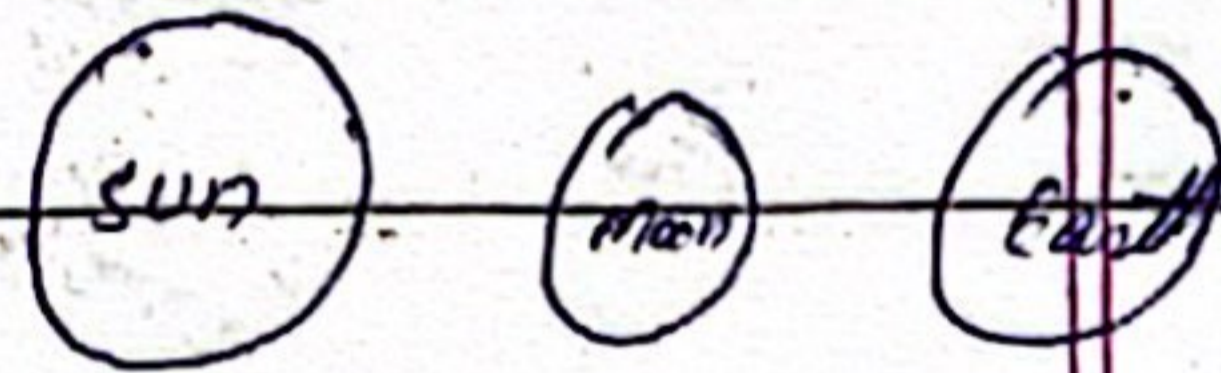
1. Eye
 - It is the center region of cyclone.
 - In this region the pressure is low.
2. Eye wall
 - It is the sides of cyclone.
 - It is 45-20km away from center.
 - Pressure is high.

Names of Cyclones



(C)

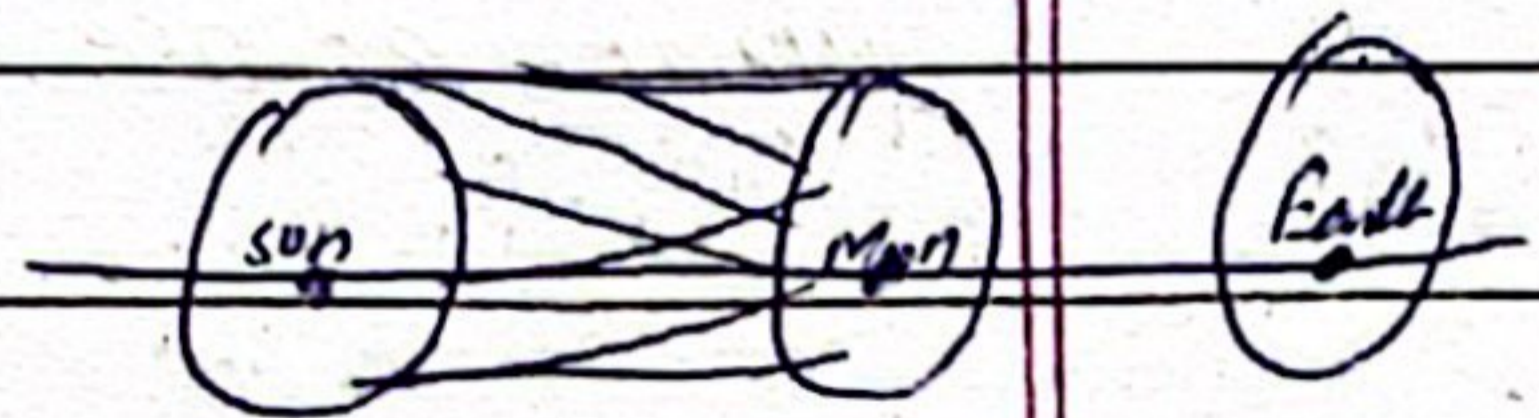
Solar Eclipses =



When moon is in between the sun and earth then such eclipses is called solar eclipse.

There are three types of solar eclipses:

(a) Total solar eclipse =



When moon is exactly aligned on the same line which having center of sun and earth, then such eclipse is known as total solar eclipse.

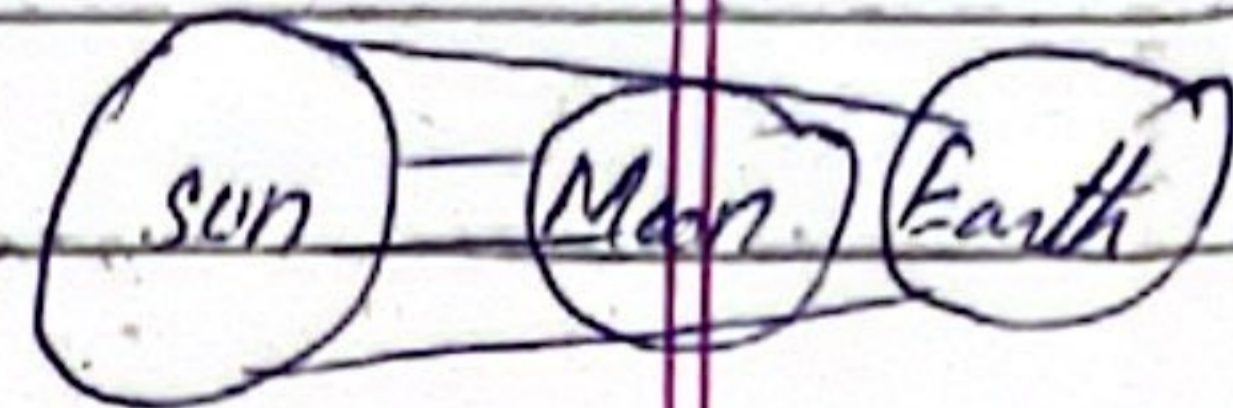
(b) Partial solar Eclipse =



When moon is above or below the line joining the center of sun and earth, then such eclipse

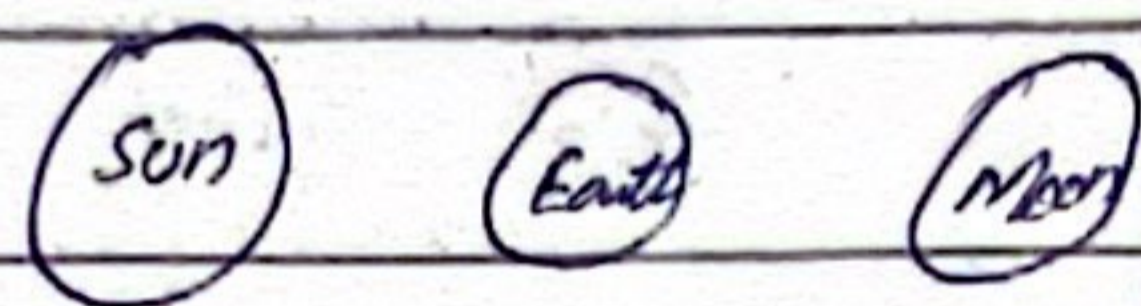
is called the partial solar eclipse.

(a) Annular Solar Eclipse =



The middle object, moon, is smaller in size than sun. So, when moon is in center but still sharp rays fall on the surface of earth and forms belly beads. This eclipse is known as annular solar eclipse.

Lunar Eclipse



When earth is in between the sun and moon, then such eclipse is known as lunar eclipse.

(a) Total Lunar eclipse



When earth is exactly aligned on the same line which joins the center of sun and moon. Such eclipse is known as total lunar eclipse.

(b) Partial Lunar Eclipse =



When earth is above or below the line joining the center of sun and moon then such eclipse

is called partial lunar eclipse.

(D)

Semi-Conductor

The ceramic materials having electrical properties in between conductor and insulator is known as semi-conductor.

Doping=

It is process in which ~~poter~~ electrical energy is used for the movement of charge because charges do not move due to strong effects of other charging.

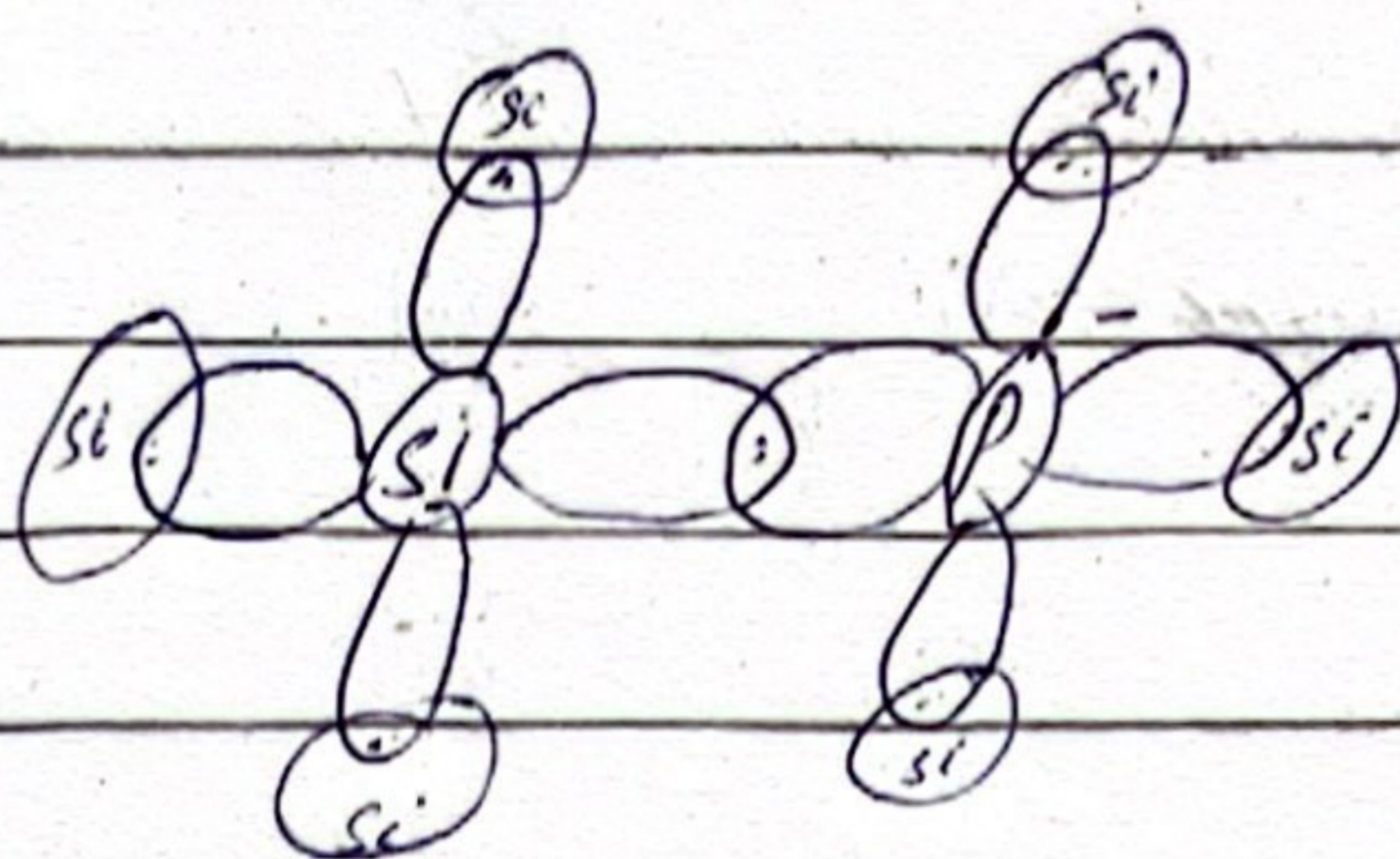
When impurity is added in pure semi-conductor then this process is called doping. It is of two types:

N-type semi-conductors=

When impurity is added from V of periodic table in the pure semi-conductor then type is known as n-type doping.

Explanation:

Phosphorus is fifth group element and it has five electrons in its valence shell. After sharing four electrons with silicon, it has still one electron in its valence shell. That's why it has negative charge on it.

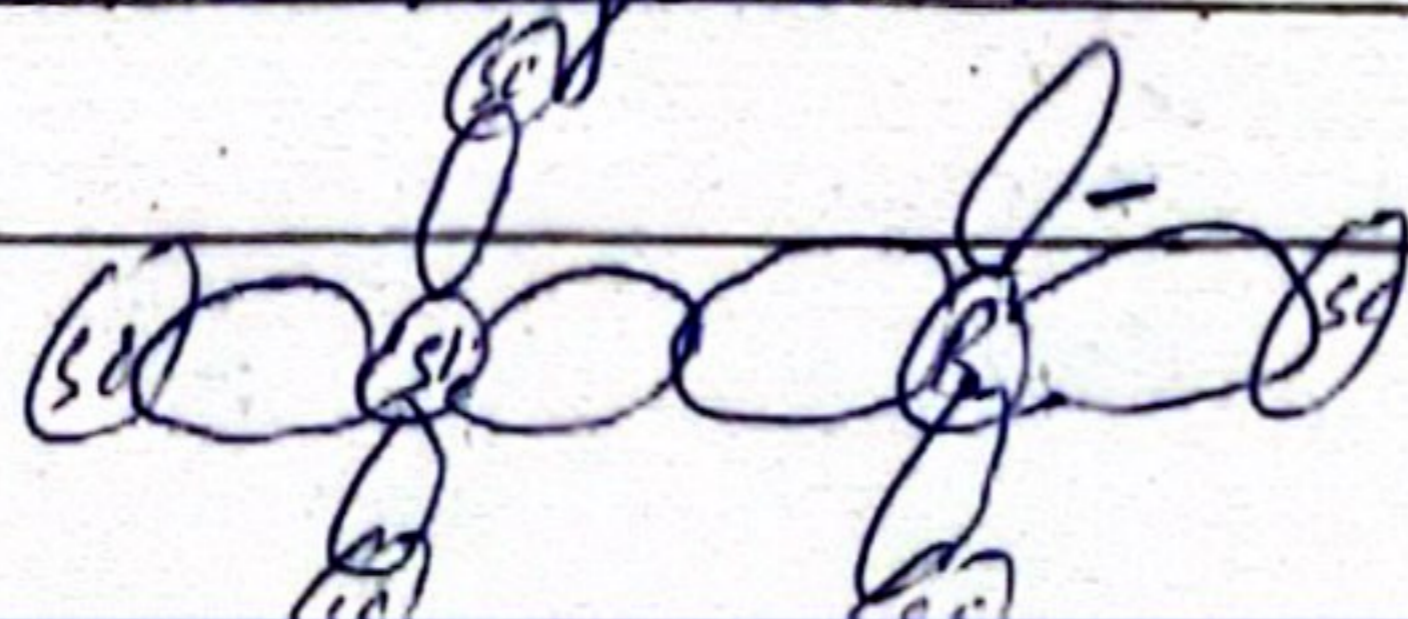


P-type semi-conductor =

When impurity from third group is added in pure semi-conductor, then it is called p-type semi-conductor.

Explanation:

Boron is third group element and it has three electrons in its valence shell. When it share its electron with silicon, then one hole is left and due to this reason it has positive charge on it.



Types of Ceramic =

- There are five types of ceramic on the basis of composition
 - ① Silicates
 - ② Oxides
 - ③ Non-Oxides
 - ④ Glass-ceramics
- Other types are:
 - ① Porcelain
 - ② Silicon carbide
 - ③ Clay
 - ④ Earthenware

Section II

Q6

(b)

Given data:

$$\text{Mean} = 50$$

$$\text{Total number} = 4 \quad (10, 30, Y, 50)$$

$$\text{Find } \Rightarrow Y = ?$$

$$\text{As, Mean} = \frac{\text{Sum of all number}}{\text{Total number of items}}$$

$$50 = \frac{10 + 30 + 50 + Y}{4}$$

$$50 \times 4 = 90 + Y$$

$$200 = 90 + Y$$

$$\Rightarrow Y = 200 - 90$$

$$Y = 110$$

Ans.

(c)

(i) 2, 6, 18, 54, _____

Sol: 2, 6, 18, 54, 162

$$\frac{54}{3} = 18$$

Explains $2 \times 3 = 6$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

(ii) 3125, 256, _____, 4, 1

Sol: 3125, 256, 27, 4, 1

$$1^1 = 1$$

$$2^2 = 4$$

$$3^3 = 27$$

$$4^4 = 256$$

$$5^5 = 3125$$

(a)

let father age = x .

then son age = y

And current age of son = 30 = y

Five years ago:

$$\text{Age of father} = x - 5$$

$$\text{Age of son} = 30 - 5 = 25$$

According to given conditions:

$$(x-5) = 3(25)$$

$$x-5 = 75$$

$$x = 75+5$$

$$x = 80 \text{ year}$$

So, father current age is 80 year

(d)

let two numbers are x, y .

According to conditions:

$$xy = 320 \rightarrow (1)$$

$$\frac{x}{y} = \frac{4}{5} \rightarrow (2)$$

From eq (2).

$$5x = y \rightarrow (3)$$

put eq (3) in (1)

$$x \times 5x = 320$$

$$5x^2 = 320$$

$$x^2 = \frac{320}{5}$$

$$x^2 = 64$$

$$\Rightarrow \sqrt{x^2} = \sqrt{64}$$

$$x = 8$$

They $y = 5(8) = 40$.

To Find=?

$$y^2 = x^2 = ?$$

$$= (40)^2 - (8)^2 =$$

$$= 1600 - 64$$

$$= 1536 \quad \text{Ans.}$$

Q7

(a)

Selling Cost of one scooter = RS 96000

$$20\% \text{ in 1st scooter} = \frac{96000 \times 20}{100}$$

$$\begin{array}{r} 960 \\ \times 20 \\ \hline 19200 \end{array}$$

$$\text{Profit} = \text{RS} 19200$$

Original cost of 1st scooter = 96000 + 19200

$$= \text{RS} 76800$$

$$\begin{array}{r} 96000 \\ + 19200 \\ \hline 76800 \\ 96000 \end{array}$$

~~Profit~~

$$20\% \text{ loss in 2nd scooter} = -19200$$

Since, profit is 19200 and loss is also 19200. So she has no profit and no loss.

$$\text{Net Profit} =$$

(b)

Men	Hourse.	Days
↑ 195	10	20
x	13 ↓	15 ↓

The relation between men and days is inverse.

The relation between men and working hourse is inverse.

$$\frac{x}{195} = \frac{10}{13} \times \frac{20}{15}$$

$$x = \frac{195 \times 10 \times 20}{13 \times 15}$$

$$x = 200$$

(c)

Given $\Rightarrow U = \{a, b, c, \dots, z\}$

$A = \{a, e, i, o, u\}$

To Find =

$A' = ?$

$A' = U - A$

$U - A = \{a, b, c, \dots, z\} - \{a, e, i, o, u\}$

$= \{b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, z\}$

(d)

Given: Shape square pyramid

$$\text{Volume} = 372 \text{ m}^3$$

$$\text{Height} = 3 \text{ Km} = 3 \text{ Km} \times \frac{1000 \text{ m}}{1 \text{ Km}} \\ = 3 \times 10^3 \text{ m}$$

To Find:

Perimeter of its base = ?

$$\text{Volume} = \frac{1}{3} \text{ Area} \times h$$

$$372 = \frac{1}{3} \times \text{Area} \times 3 \times 10^3 \text{ m}$$

$$\frac{372 \times 3}{3 \times 10^3} = \text{Area}$$

$$\text{Area} = \frac{93}{250} \text{ m}^2$$

$$\sqrt{\text{Area}} = \sqrt{\frac{93}{250}} \text{ m}$$

$$\text{Length/Base} = 0.609 \text{ m}$$

$$\text{Perimeter} = 0.609 + 0.609 + 0.609 + 0.609$$

$$= 2.43 \text{ m}$$

Part II

Section 1

Q2

(a)

COP-28=

Conference of Parties-28 held in UAE in November 30 to December 12, 2023. During these days lot of meeting and seminars were held and some key decision is taken. The important key issue that is discussed in this meeting is Activation of "Loss and Damage fund."

Collection of Funds=

About \$700 million dollars have collected in which Italy and France contribute \$105 million each. USA contributes \$475 million, UK and UAE contributes \$400 million dollar each. According to UNSC Report about 240 to 350 Billions dollar will be need to mitigate the consequences that vulnerable faced due to climate crisis. Collected money is not enough to mitigate the consequences.

Distribution and Handling of Money=

The main conflict is how to utilize this money and which institutions will perform this. South Asian and African countries want to build new institutions, but USA, EU and UK support WB for it. Currently, World Bank is performing and after next meeting new institution will be built for this purpose.

Work for Mitigating the Fuel Burning =

UAE along with other countries agree to reduce the burning of fossil fuel and promote the renewable energy. More than 100 countries agreed and committed under the UNCCC Councilship.

Work on Capacity building, Resources Mobilization and Institutional Reforms.

Main focus on capacity building by adopting sustainable process. Similarly, developed countries ensure that source are mobilization towards the vulnerable countries and using these, Under-develop countries reform their institutions. Pakistan is facing serious tribule due to climate issues. As per German watchdog Pakistan is 8th most vulnerable country that faces climate crisis.

Conclusion=

The main process is to select the most vulnerable countries and provide more sources to these countries. Other than, the agreement between countries to mitigate the use of oil is essential.

(b)

Solid Waste Management=

The authority which is specially designed to perform the work starting from collection of waste to the disposal of waste is controlled through strategy which is known as solid waste management.

Characteristics of Solid Waste Management=

There are some characteristics of SWM.

1. Collection Team=

A strong and experienced collection team along with small and large vehicles are required. This process is expensive but many advantages ^{can be} obtained.

2. Collection Point=

The collection point must be at the center of city. Make sure that

there is no college, hospital within radius of 6km from collection point.

3. Separation of waste =

At collection point the separation process is performed. Plastic waste etc can be solved and other waste is either dump or decompose according to suitable conditions.

Methods

Open dumping =

It is technique in which waste is dumped. It is used in old day but not practiced in these days because of air and land pollution. Secondly, open dumping is hazardous and damage the land along with water process.

Compositing =

In this organic waste is composting and obtained product which is known as composite is used for the agriculture purpose as a fertilizer.

Incinerated = Incineration

It is mostly used for household waste and hospital waste. Organic waste is used in it and burn in incinerated.

Minimum temperature required is 100 to 300°C

Land Filling:

It is also used to decompose the waste. But, it has a problem that it contaminate the underground water. In these day, governments not allowed this technique due to environment issues.

(C)

Balance Diet

It is the diet which contains the right quantity of essential nutrient. The essential nutrients are:

1. Carbohydrates 2. Fats 3. Proteins

4. Vitamins 5. Water 6. Minerals

Carbohydrates: These are essential for the healthy working system, heart, kidney and muscular system. It fulfill the needs of energy. Main sources of carbohydrates are Wheat, milks, vegetable, fruits.

Proteins: Essential for muscles building, healing process and also fulfill the energy needs.

Main sources of proteins are milk, eggs, meat etc.

Fats = They are source of energy and provides fat soluble vitamins (A, D, E, K). Main sources of fats are milk, meat, oil, fish etc.

Minerals =

Minerals are essential for the bones, hearts, kidneys, strong healing process, teeth etc. Main minerals are calcium, potassium, copper, iron etc. Sources of minerals are: Milk, diet, vegetables, fruits, salt, sea food etc.

Vitamins = They are organic substance which fulfill the needs of human body. Main vitamins are A, D, E, K. Lack of vitamin A causes night blindness. Similarly, lack of vitamin D leads to rickets. Sources of the vitamins are fruits, meat, eggs, milk, dry fruits.

Water = Most essential in balance diet. It is required to maintain body temperature. It is required to lubricate the body parts and fulfill the needs of body.

(d)

Renewable Energy =

The energy which can be ~~formed~~^{formed} from renewable resources and which can be environmental friendly is known as renewable energy. Example, solar energy, wind energy etc.

Projects under CPEC =

About 2000 MW energy is produced after the completion of projects. Main projects are:

Civil Nuclear Projects =

K2 \Rightarrow 4400 MW	Completed and operation
K3 \Rightarrow 4400 MW	Completed and operation
C5 \Rightarrow 4400 MW	Under installation.

Wind Projects

About 3000 MW energy is produced from these projects.

Coastal belt of Sindh (Jamper).

Boarding Area of Iran-Balochistan (Das-Bandees)

Solar Projects =

Many small and large projects are already completed like Qasid-e-Azam Solar Park Bahawalpur. Similarly about 600MW solar project is under the completion in Guwadar.

Conclusion =

According to Energy Policy 2030, more than 80% of energy will be obtained from renewable energy. Many projects are completed and some are under-working.