

→ (2019 : General Science)

→ Q No# 5 (d)

Why do atoms form bonds?

⇒ Atoms always try to lose, gain, or share their valence electrons ^{therefore} in order to complete their valence shell. ^{therefore} Atoms form bonds.

Example:

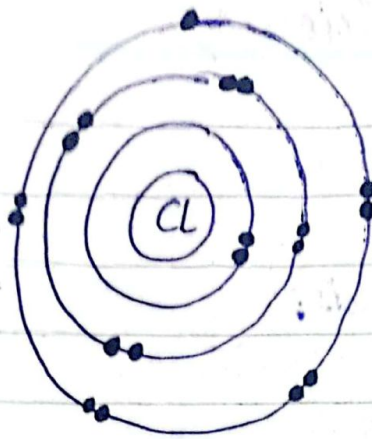
Sodium has 11 electrons because it has atomic number 11.



→ Na = The third shell of Sodium has one electron only but the capacity of filling of electron in third shell is 18. Therefore, Sodium will lose its electron and make a bond with other non-metal atom.

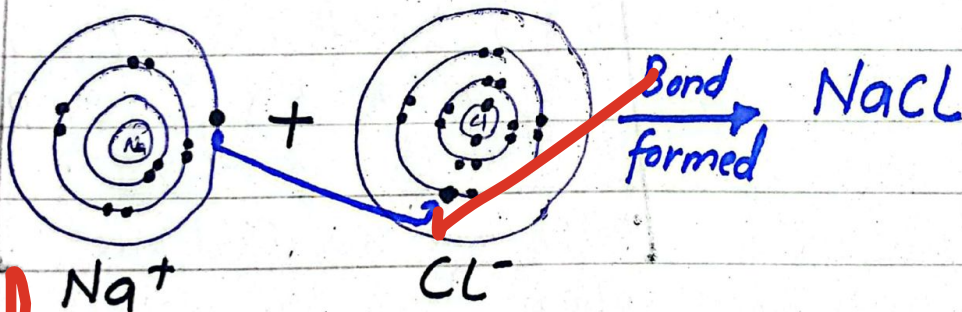
⇒ Therefore, when Sodium loses one electron, it will have (+1) charge because cation is formed. $[Na^{+1}]$

⇒ Now because Sodium is metal it is losing its one electron and chlorine will come and it will make a bond with sodium because chlorine is non-metal.



CL = Chlorine has atomic number 17, but the valency of third shell is 18. Therefore, chlorine will try to gain $1 e^-$ in order to complete its valence shell.

Now what happens is that any metal ion will come and give its electron to sodium for the completion of its valence electron -
for example : Sodium is coming to give its one electron to chlorine.



This is how a bond is formed between two atoms.

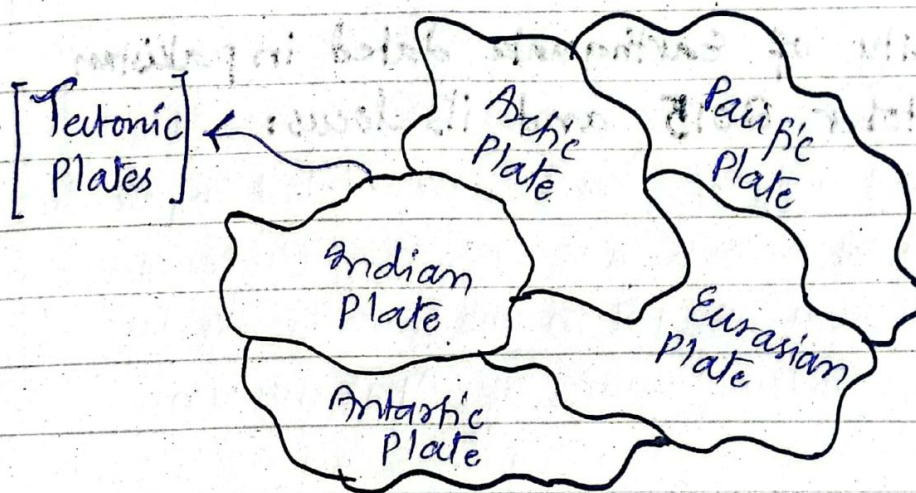
- ⇒ Three major types of Chemical Bonds:
- The three major types of Chemical bonds are:
- 1/ Ionic bond
 - 2/ Covalent bond
 - 3/ Coordinate or Dative covalent bond.

Q No # 7 (b)

What is an Earthquake:

There are Tectonic plates that are present in our planet earth. When these Tectonic plates move they causes Earthquakes.

⇒ **Tectonic plates:** The lithosphere is not a continuous wrapper. Rather, the lithosphere is made up of pieces of plates and these plates are called Tectonic plates.



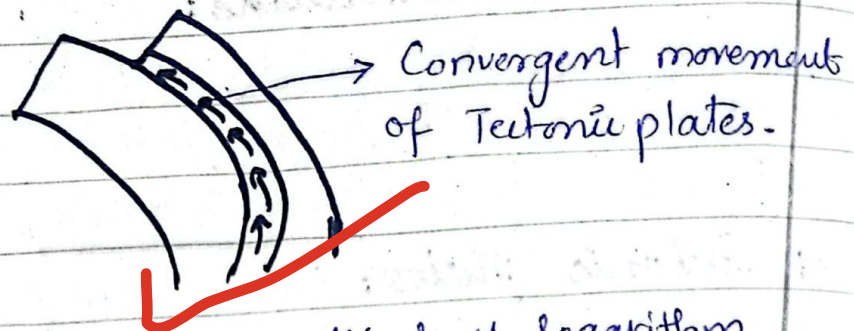
→ **Movement of Tectonic plates can be Divergent or convergent:**

1) Divergent Movement: When two Tectonic plates move away from each other causes divergent Earthquake of Tectonic plates.



Tectonic plates moving away

2) Convergent Movement: When two Tectonic plates slide over another it causes convergent Earthquake of Tectonic plates.



→ Richter Scale: It is a kind of logarithm Scale (0 → 10) that is used to detect the Earthquake Intensity.

→ Intensity of Earthquake dated in Pakistan
26 October 2015 and its locus:

The intensity of earthquake dated in Pakistan on 26 October 2015 was 7.5 magnitude. The epicentre was located in the remote Hindu Kush mountain range of Afghanistan.

2022

Q No # 2 (a)

What do you know about volcanoes?
Volcanoes is defined as a phenomenon in which an opening of the surface of the Earth from which magma rises on the surface.

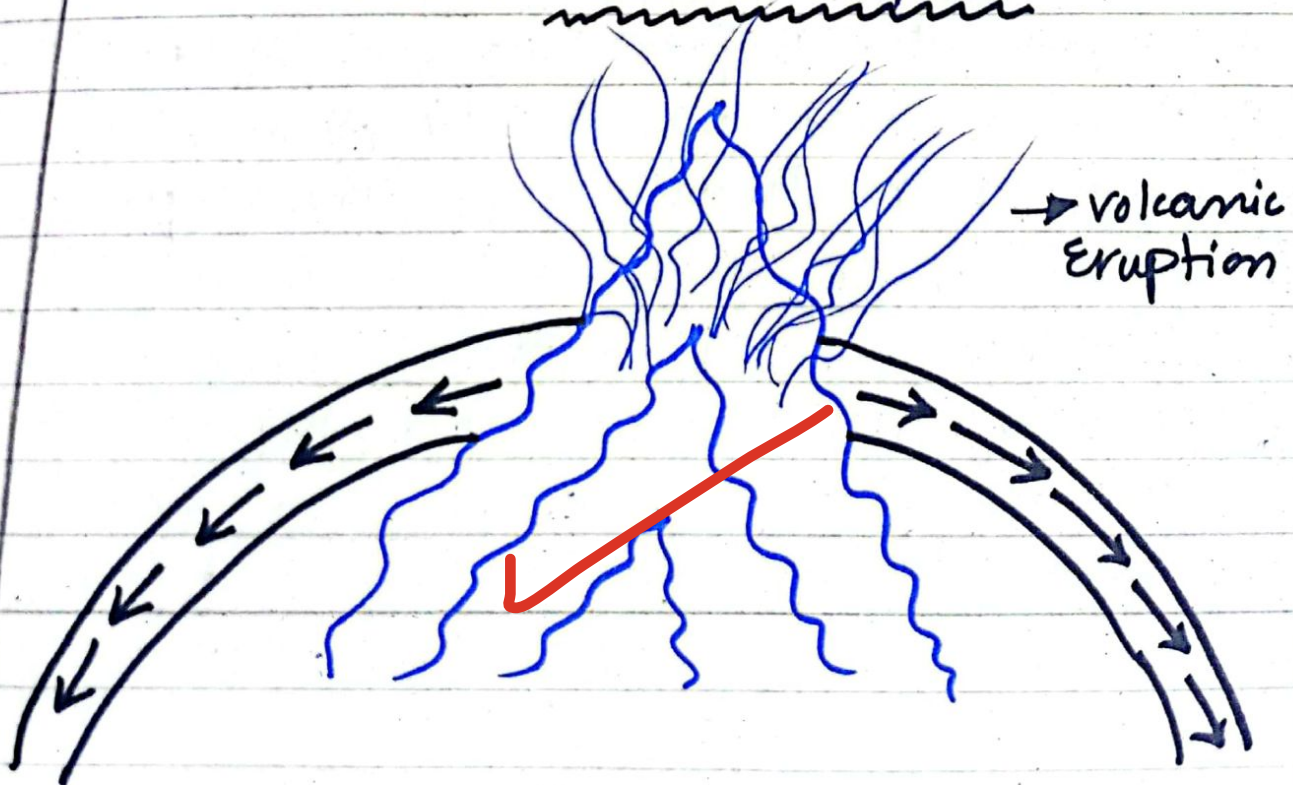
→ Process of volcano eruption:

Magma is thick rock hotted liquid inside the earth.

↓
Magma rises over the surface of Earth.

↓
Magma rises and rises and it burst

↓
When it burst it is Lava and is called volcanic eruption.



⇒ Causes of volcanic Eruption:

→ The three major causes of volcanic eruption are:

1) Via subduction: Dehydrates to form new melt.

2) Via Rifting: When two Tectonic plates move away from each other, volcanic eruption may occur.

3) Via Hotspots: means volcanic eruption occurs from the middle of the Tectonic plates.

⇒ Effects of volcanic eruption:

→ The effects of the volcanic eruption are:

1) It causes rapid eruption and from that eruption all the pollutant gases comes in Environment which causes Health related problems.

2) It causes environmental pollution.

3) It can also trigger Tsunami in seas.

4) It causes socio-economic disruption.

5) Lives of the human beings can be affected.

Q NO # 7 (a) 2016

Q NO # 4 (d) (2018)

→ **Tsunami:** Tsunami is the sudden rise of the sea level ^{to the coast line} and causes catastrophic damage. Almost 80% of the Tsunamis occurs in the Pacific region of the Earth.

→ **Different causes of Tsunamis:** The different causes of Tsunamis are:

- 1) Due to Earthquake.
- 2) Due to volcanic eruption.
- 3) Owing to Asteroid hitting in the sea can cause Tsunami.

→ **Measurement Methods:**

→ Richter Scale of 7, it means Tsunami is generated (in case of Earthquake as a cause of Tsunami only).

→ **Difference between a Tsunami and Tidal wave:**

Yes, there is a difference between a Tsunami and a Tidal wave. Tsunami is the sudden rise of sea level to the coast line and causes catastrophic damage. While, Tidal wave is just a wave on the coast line and does not cause any harm and damage.

→ **The worst Tsunami Ever Recorded:**

discuss the differences in tabular form by giving multiple points.

(2022)

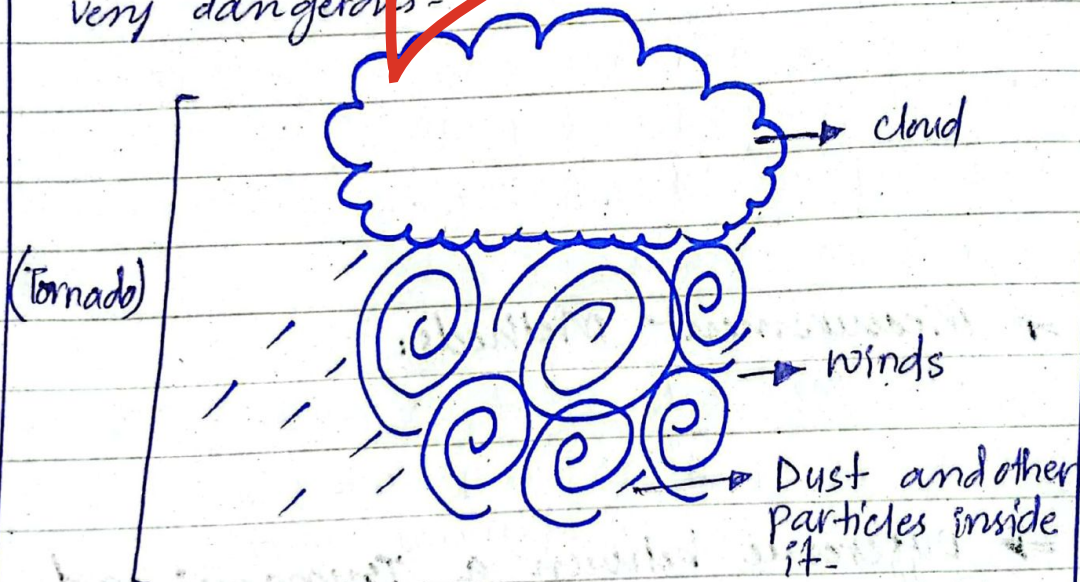
→ (Friday)
→ 11-4-25

Q No # 2(c)

What is a Tornado?

Tornado is defined as the strong and violent winds emerging by a cloud and can cause great casualties owing to its strong and violent nature of winds.

→ It can mostly last for ten minutes but very dangerous.



→ How is it formed?

→ Tornado is formed by a cloud and its heavy winds together, collectively emerge in an specific area for a short duration of time.

→ Effects of Tornadoes: Effects of Tornadoes are:

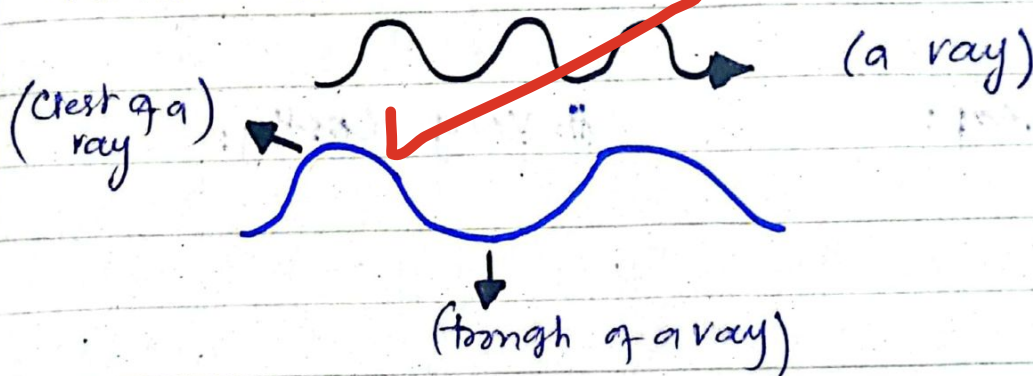
1. It can cause loss of flora and fauna.

discuss in slightly more detail.

- 2) It can cause the destruction of buildings.
- 3) It can cause the loss of economy.
- 4) It can cause Air pollution.
- 5) It can create great ^{changes in} ~~disturbance~~ ^{such as} ~~over~~ human behaviour ^{such as} ~~causing~~ ^{leading to} sudden rise of tornadoes in an specific area.

Q No # 8(b) 2016

Gamma Rays: Gamma rays is the type of electromagnetic radiations. It has wavelength shorter than 0.01 nm (nanometers).



Applications of Gamma ray:

The applications of Gamma rays are:

- 1) Gamma ray is used in the medical procedure for the diagnosis of many diseases.
- 2) Gamma ray can be used in the process of Artificial radioactivity.

(2019)

Q No# 3(a)

Difference Between:

Renewable Energy

(i) Re-usable:

- Renewable energy is the type of energy that can be used again and again.

(ii) Cheap:

- This type of energy is not very costly, so, it is cheap.

(iii) Examples of Renewable Energy:

- Wind Energy, Solar Energy, Tidal Energy etc.

Non-Renewable Energy

(i) Not-Reusable for a long period of time

- Once used: Non-Renewable Energy is the type of energy that cannot be used again and again once it is used.

(ii) very costly:

- This type of energy is very costly. Not everyone can afford to buy.

(iii) Examples of non-Renewable Energy:

- Coal, petroleum, Natural Gas etc.

add more arguments.

Q No# 2(d) (2021)

→ Advantages of Renewable Source of Energy:

* The main Advantages of the Renewable Source of Energy are:

- 1) It is present almost everywhere.
- 2) It can be re-used again and again.
- 3) It is economic friendly.
- 4) Examples are Solar Energy, Wind Energy and Tidal Energy etc.

→ Limitations of Renewable Source of Energy:

* The limitations of Renewable Source of Energy are:

- 1) If flora or fauna is more exposed to them then it cause harm to them. for example, More exposure to Sun rays can cause Skin cancer.

→ Neo-conventional Energy Sources in Pakistan:

* The neo-conventional energy sources in Pakistan are:

- 1) Coal, 2) Petroleum 3) Natural Gas
- 4) Ores 5) Minerals.

2016

Q No# 4(a)

⇒ **Vaccines:** vaccines are sterile dosage form of medicament that are used to kill or inhibit the growth of micro-organisms in the body.

⇒ **Classification of vaccines:** The classification of vaccines are:

1) **live attenuated vaccine:** It is a type of vaccine in which the micro-organism is live - example: Polio vaccine.

2) **Killed vaccine:** It is a type of vaccine in which microbe is first killed and then it is put inside the vaccine -

3) **Toxoid vaccine.** Toxoid vaccine is a type of vaccine in which first the toxin of micro-organism is diluted with water and then it is put inside the vaccine.

Preparation -

1) **Conjugate vaccine:** It is a type of vaccine in which vaccine is made by the conjugation of live or killed vaccine with Toxoid vaccine.

⇒ **other classification of vaccines:**

⇒ The other classification of vaccines are

• (i) Single Stranded RNA vaccine.

~~(ii) Double Stranded RNA vaccine.~~

(iii) Single Stranded DNA vaccine.

(iv) Double Stranded DNA vaccine.

→ **DNA vaccine:** DNA vaccine is a type of vaccine that is prepared by taking the DNA of the micro-organism. And, when this DNA comes inside the body, it triggers the production of antibodies.

Q No # 2 (c) (2018)

Dark Matter: Dark Matter is the matter from which the whole Galaxy, solar system is made. It is whole concentrated matter that gives birth to Galaxy, solar system, planets, and other celestial bodies.

Dark Energy: Dark Energy is the energy in the universe which is invisible but present everywhere. It is anti-gravity. It is an energy that keeps Galaxy, solar system and other bodies on their mean position.

Q No # 2(c)

2019

Why the excessive use of chemical Fertilizers should be avoided?

Fertilizers: are chemical compounds that are used to increase the fertility of the soil and plant to increase their growth and development.

Fertilizers ~~Excessive~~ Use should be avoided because they have negative affect such as:

- (i) **On Health:** Fertilizers in excessive concentration in plant comes to human body through intake so excessive mineral concentration can cause harm to the Health.
- (ii) **On Aquatic life:** When these fertilizers reach to the aquatic life can cause harm to Aquatic species.
- (iii) **On plant:** If excessive concentration can be given to plant then this stress can not be undo by plant ultimately it shrinks and dies.

QNO# 3(d)

Vaccines

- i) vaccine is the sterile dosage form of preparation.
- ii) Vaccine is given parentally.
- iii) vaccine is made up of live, killed, conjugate or Toxoid micro-organisms.
- iv) Examples of Vaccines are: polio vaccine, Tetanus vaccine, T.B vaccine, Measles and Mumps vaccine etc.

(v) Vaccine gives life time immunity against microbe.

Antibiotics:

- i) Antibiotic is the oral dosage form of preparation.
- ii) Antibiotics is given orally.
- iii) Antibiotics is made up of Active pharmaceutical ingredient with excipients.
- iv) Examples of Antibiotics are: Ciprofloxacin, Levofloxacin, Ceftriaxone, Carbapenems etc.

(v) Antibiotics cannot give lifetime immunity against microbe.

⇒ How do antibiotics and vaccines contribute to Health:

⇒ The main purpose of giving antibiotics and vaccines to human is to decrease the growth of micro-organisms inside the body and to protect the immunity of an individual, to fight against pathogens.

QNO#5(c) 2019

→ Why an Indiscriminate / casual Use of antibiotics may prove fatal?

→ Antibiotics: Antibiotics are the medicament that are used to kill or inhibit the growth of micro-organisms in the body.

→ Reason: When anti-biotics are given to the patient, then due to its casual use the normal flora of the Intestine get disturbed and ultimately the person have diarrhea. Owing to this condition, the body of an individual become dehydrated. The other reason is owing to the casual use of antibiotics the body's microbe that is present inside and for which the person is taking antibiotic. It get resist. Therefore Antibiotics taking will not have its any affect on Microbe.

Q No # 3(a) 2022

→ Vaccination: Vaccination is a process through which vaccine is given to an individual, or animal and after which body makes antibodies against antigen that is introduced in the body.

→ Types of vaccines: The different types of vaccines are:

1) Live attenuated vaccines: It is a type of vaccine in which microbe is live.
example: polio vaccine -

2) Killed vaccine: It is a type of vaccine in which microbe is killed and then vaccination is given to an individual.

3) Toxoid: It is a type of vaccine in which toxin of the microbe is diluted with water.

4) Conjugate vaccine: It is a type of vaccine in which live or attenuated killed vaccine is conjugated with Toxoid vaccine -

→ Side-effects of vaccination:

→ The different side effects of vaccines are:

1) It can cause inflammation over the skin areas where the vaccine is given.

- 2) It can cause allergic reactions.
- 3) It can cause rashes to the skin -
- 4) It can cause hypersensitivity to an individual -

⇒ Effectiveness:

Because, vaccine is directly given parenterally to the patient either Intravenously, Intramuscularly or subcutaneously. Therefore, It can directly reach to the blood. so, Vaccines are very effective.

9.5