

## Question no: 5(d)

Why do atoms form bonds?  
Name three major types of chemical bonds. (5)

### Need of Atomic Bonding:

Atoms form chemical bonds with other atoms in order to become more stable. Atoms are made up of smaller particles called protons, neutrons and electrons. ~~Their~~ Protons and neutrons reside inside nucleus, while electrons orbit the ~~the~~ nucleus. As the outermost shell of most ~~electrons~~ atoms lacks the electrons necessary to gain stability, so they form chemical bonds in order to complete their outermost shell with either eight electrons in it (following the octet rule) or 2 electrons (following the duplet rule).

**Examples:** Common examples include Na, Li.

# Three Major Types of Bonds:

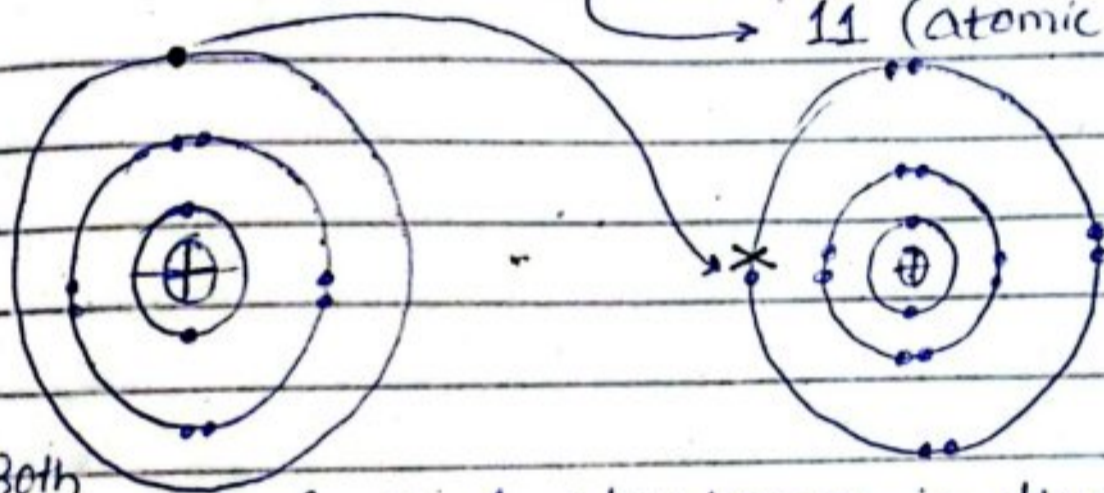
The three major types of bonds are:

- o Ionic bonds
- o Covalent bonds
- o Metallic bonds.

## 1. Ionic bonds:

These are formed by complete transfer of electron from one atom to another atom.

For example:  $\text{NaCl} \rightarrow 17$  (atomic number)  
 $\rightarrow 11$  (atomic number)

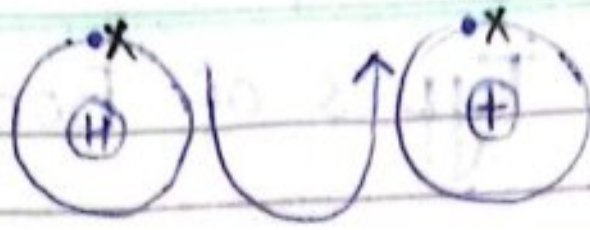


Both ~~are~~ having 1 electron in their outermost shell. They tend to gain 1 electron in order to complete it 8 electrons in outermost shell.

## 2. Covalent Bond:

It is formed by mutual sharing of electrons between atoms.

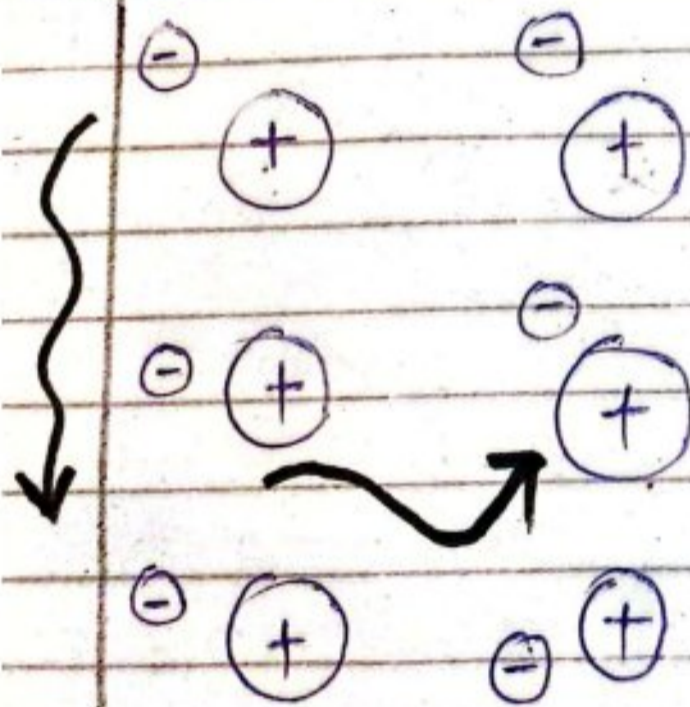
For example: Hydrogen gas exists in diatomic form ( $\text{H}_2$ ).



Both etc can't loose their electrons so they can mutually share electrons. As they both electrons can't be equally transferred.

### 3. Metallic Bonds:

Metallic bonding occurs when a group of metal atoms shares a cloud of valence electrons.



This shows the bond formed between free electrons and the positively charged metal atoms.

Metals can be Iron, copper etc.