

Depending on electrical conduction properties of diff materials they can be classified as:-

① Insulator ② Semi-conductor ③ Conductor

① Insulator:- Poor conductor of electricity is called Insulator.

ex → Rubber, Glass

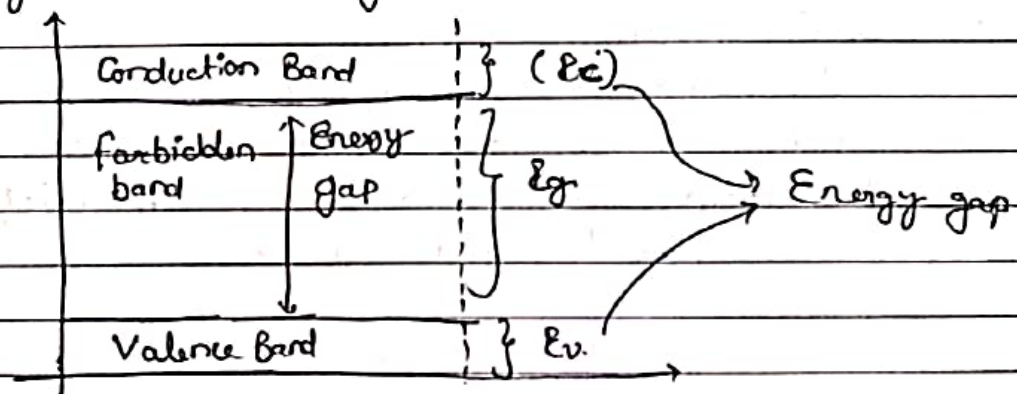
② Conductor:- an excellent conductor of electricity.

ex → Copper, Gold

③ Semi-conductor:- It is a material whose electrical conductivity lies b/w insulator and conductor.

ex → Germanium, Silicon

• Energy Band Diagram

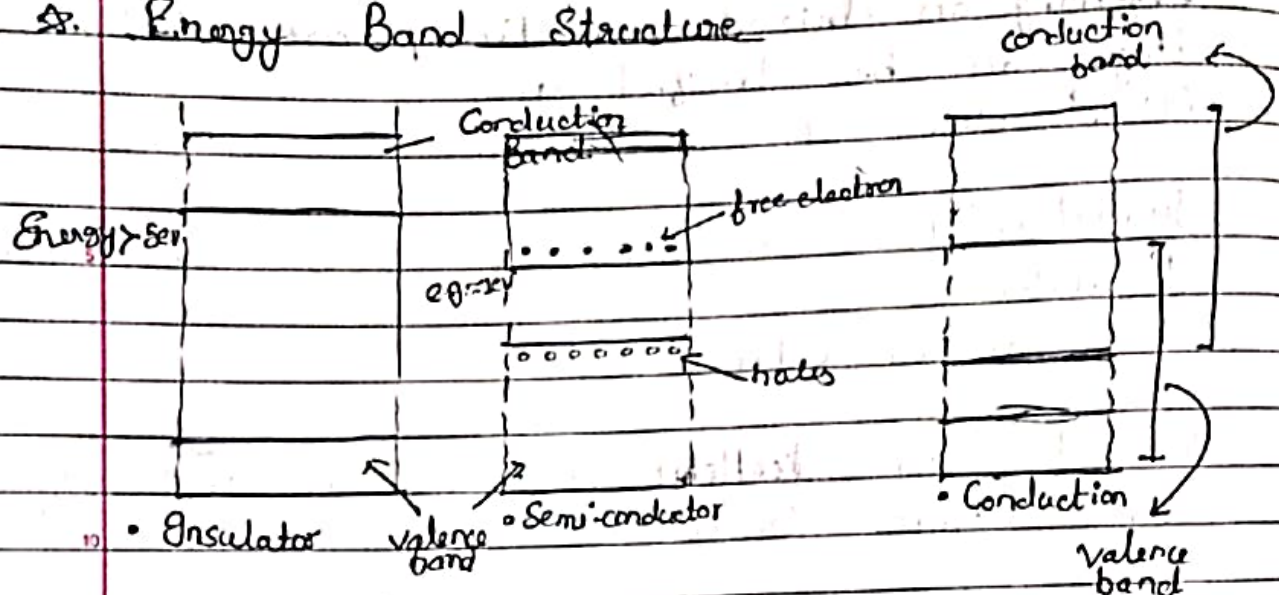


Valence Band: The energy band which has the valence electron which is present in the outer most shell of a electron.

→ The valence electron when provided sufficient energy gets changes in free electron and moves to conduction band and cause conductivity

→ These 2 bands are separated by a certain amount of energy known as forbidden energy gap

* Energy Band Structure



- * Insulator:-
- ① conduction band is empty
 - ② Valence band is filled
 - ③ The energy gap is very large.

* Semiconductor:-

- ① In terms of energy bands semiconductor can be defined as those materials which at room temperature has partially filled valence band and a very narrow energy gap.

* Conductors:- In terms of energy bands conductors are those which have overlapping valence band and conduction band so large no. of conduction electrons are present in conductors.

* Elemental Semiconductors

The elemental S.C. are those composed of single species of atoms such as silicon, germanium, selenium, Tellurium.

* Compound Semiconductors

They are composed of 2 or more elements
ex- gallium-arsenide.