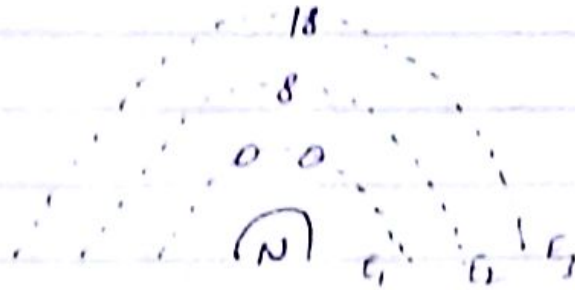
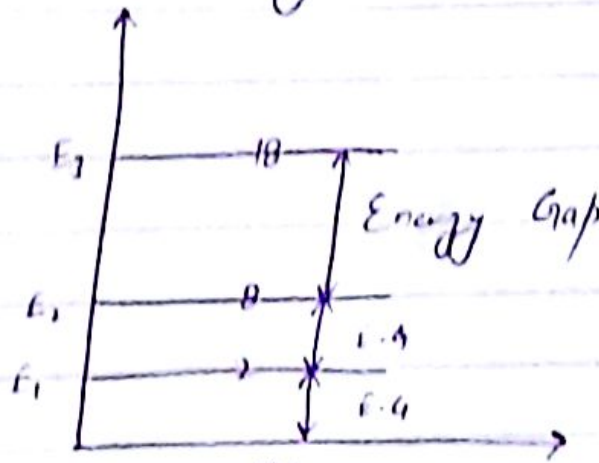


(Lecture 3)

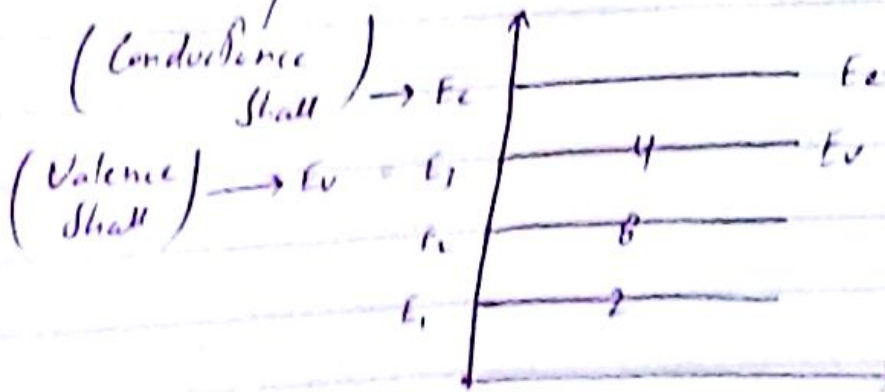
Energy band Theory



→ Energy Level Diagram



Example Silicon (Si^{14})



- Outermost shell is Valence shell
- Conduction occurs in Conduction shell.

Energy required to convert valence electrons into conduction electrons is called work function.

$$\Delta E = E_c - E_v \quad (\text{work function})$$

Question:-

What is Energy band Theory?

Ans:-

It describes the conductive property of material on the basis of Energy band Diagram.

Now Differentiate Conductors, Insulators and Semi-conductors on the basis of Energy band Theory.

• Conductors:-

In conductors, both the valence shell and conduction shells are partially filled.

• Insulators:-

Energy gap b/w Valence shell and Conduction shell is too large, if we will give that energy to material, then its properties will be destroyed.

- Valence band is partially or fully filled
- Conduction band is partially or fully empty.

• Semi-Conductors:-

Intermediate energy gap b/w Conductors & Insulators.

- Valence band is half filled.
- Conduction band is fully empty.