Fermi level, Lecture-8

TDC PART -1

PAPER 1(GROUP B)

Chapter -4

BY:

DR. NAVIN KUMAR

(ASSISTANT PROFESSOR)

(GUEST FACULTY)

Fermi level

- DEFINITION:The Fermi level is the surface of that sea at absolute zero where no electrons will have enough energy to rise above the surface.

Where is the Fermi level?

- The Fermi Level is defined as the highest occupied molecular orbital in the valence band at 0 K, so that there are many states available to accept electrons, if the case were a metal. It should be noted that this is not the case in insulators and semiconductors since the valence and conscution bands are separated.

Fermi level important in semiconductor

- The Fermi level determines the probability of electron occupancy at different energy levels. The closer the Fermi level is to the conduction band energy, the easier it will be for electrons in the valence band to transition into the conduction band.

Importance of Fermi level

- It is important in determining the electrical and thermal properties of solids. The value of the Fermi level at absolute zero (−273.15 °C) is called the Fermi energy and is a constant for each solid. The Fermi level changes as the solid is warmed and as electrons are added to or withdrawn from the solid.