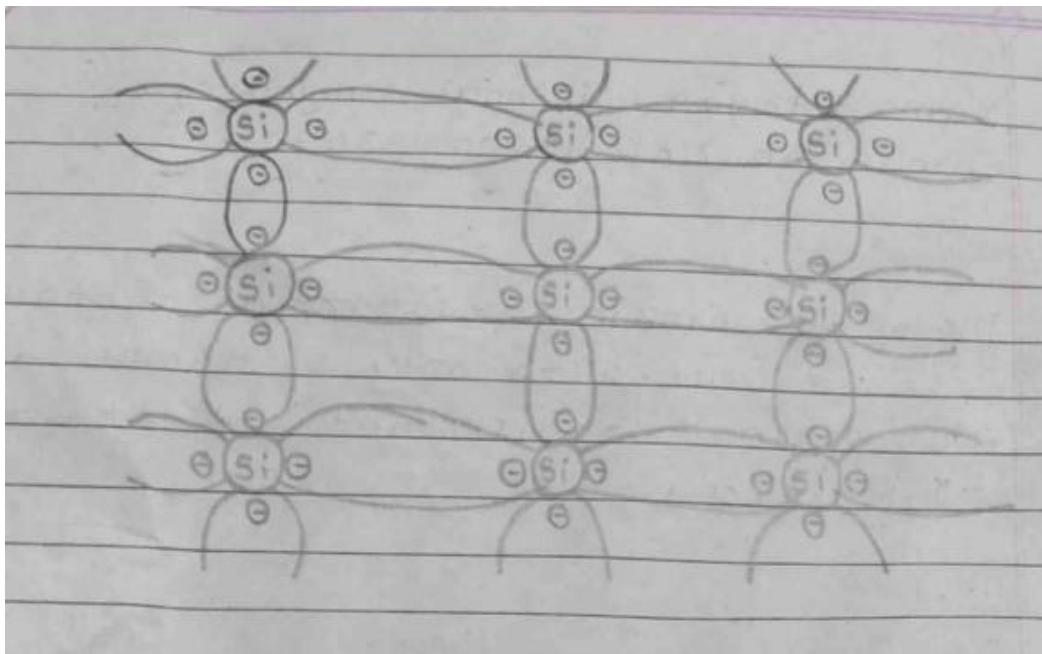
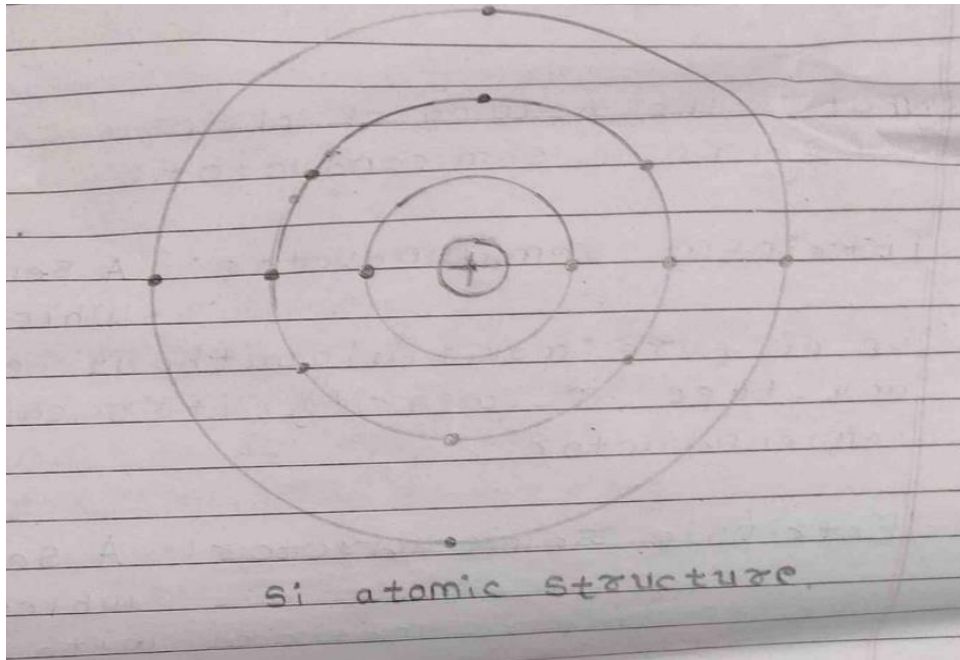




Assignment-Semiconductors

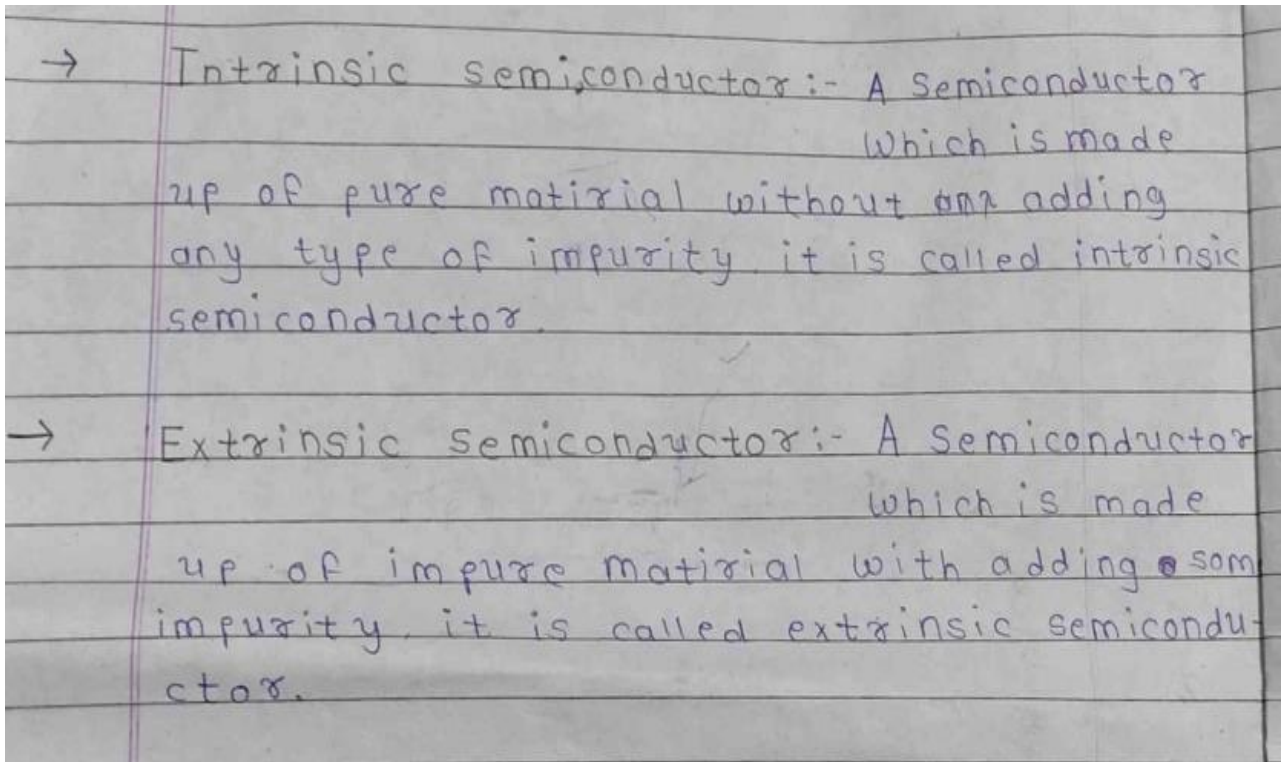
CO-1

- Q-1 Draw the atomic structure of Si atom. Consider a crystal with only Si atoms, draw the covalent bonding and indicate the covalent bond.

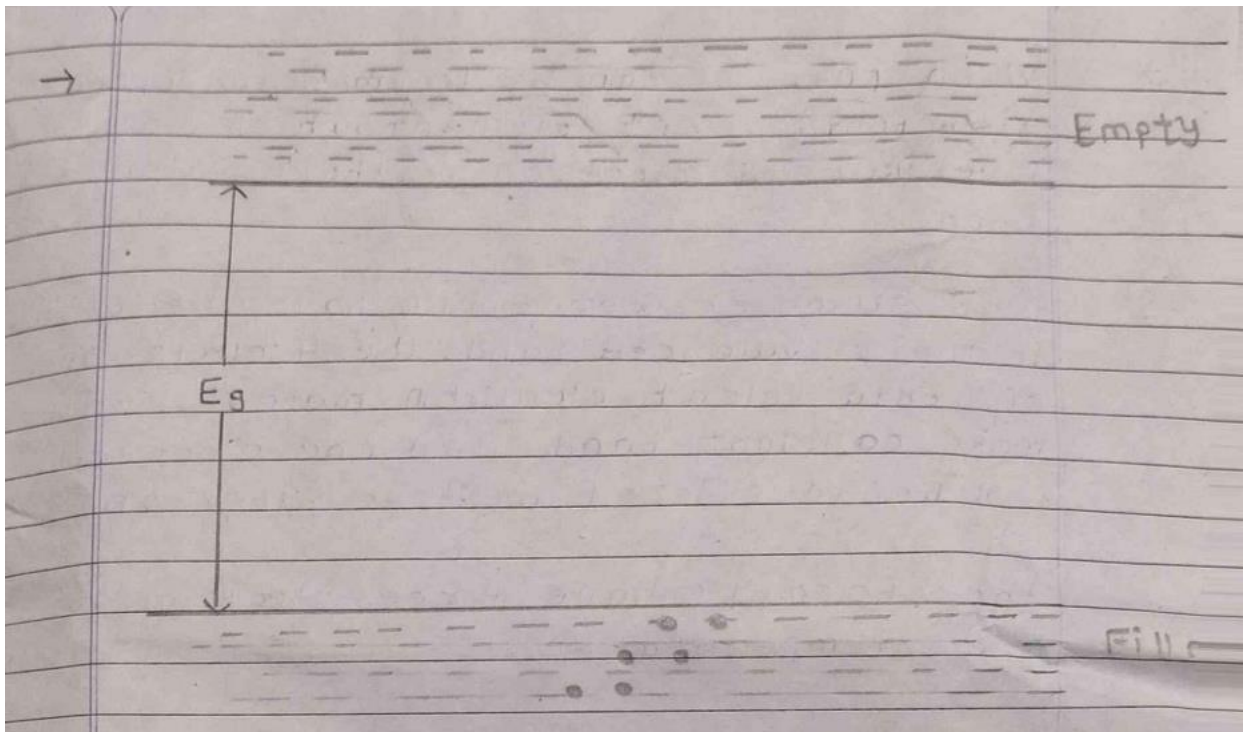




Q-2 What is the meaning of intrinsic semiconductor and extrinsic semiconductor?

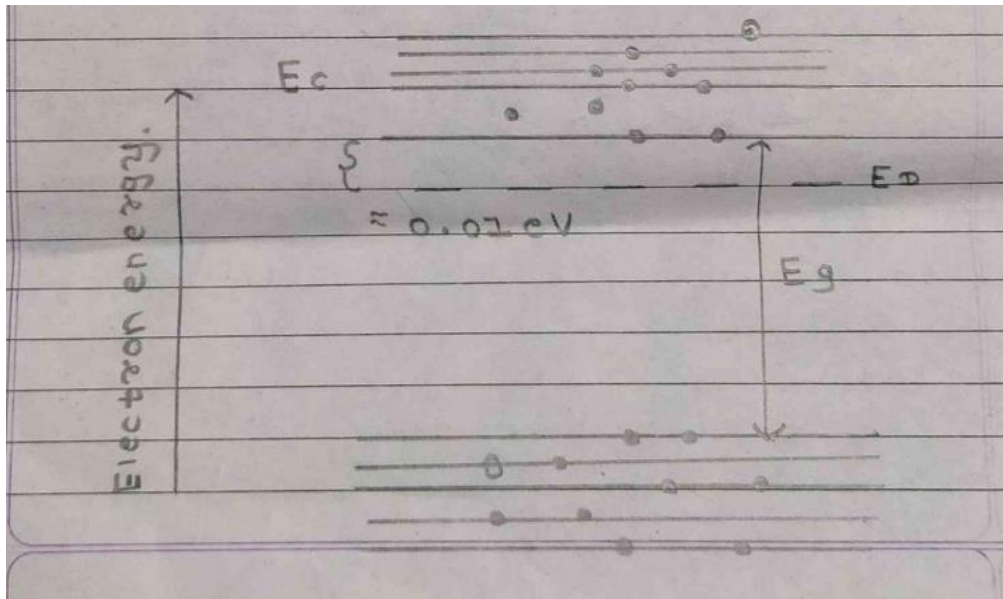


Q-3 Draw the energy band diagram for intrinsic Si atoms when bounded together.





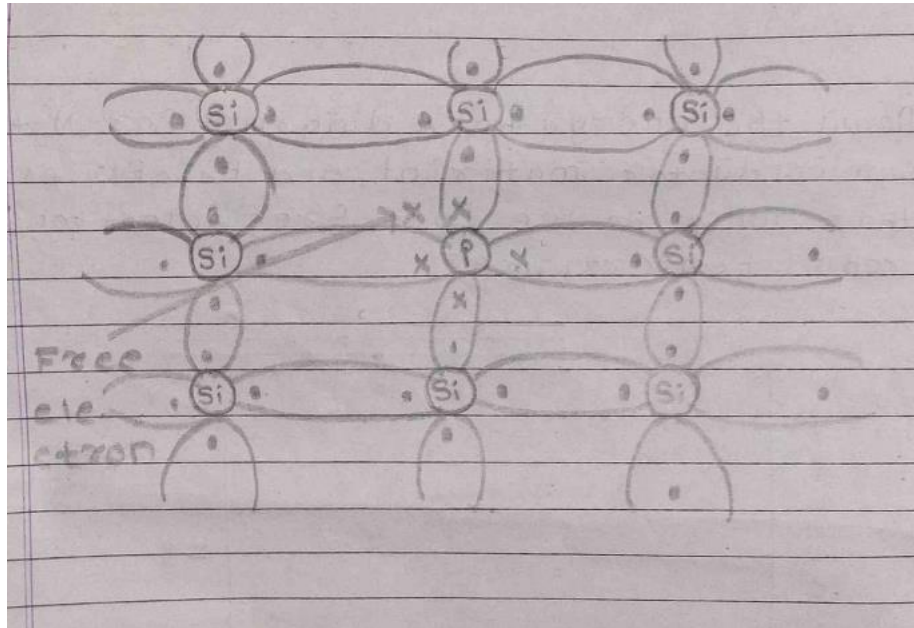
Q-4 Draw the energy band diagram for N-type semiconductor material and briefly explain that why do we have free electrons at room temperature?



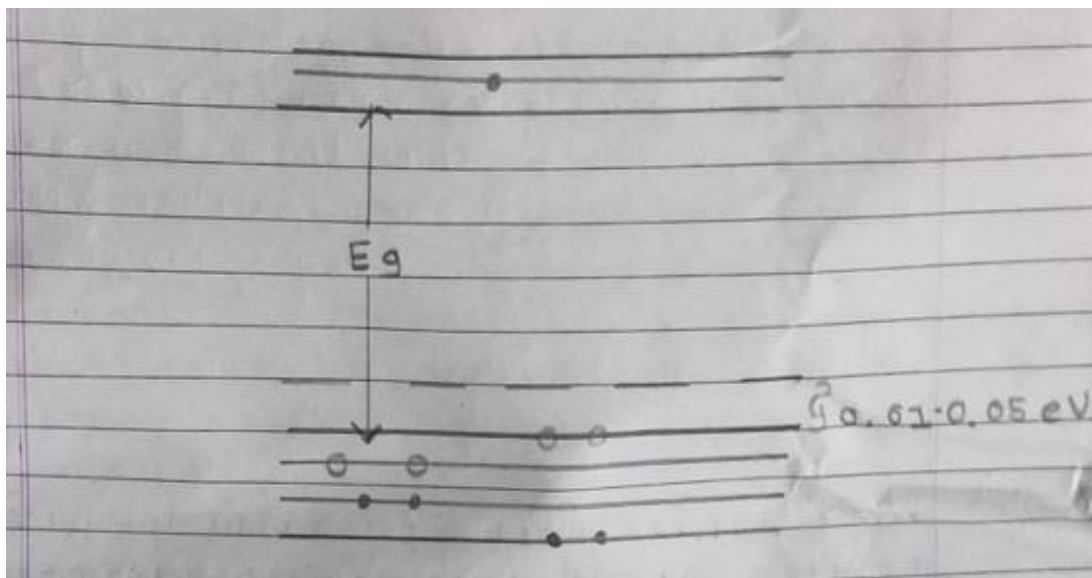
When pure silicon or Germanium doped with penta-valent element which have five valenced electron in their valenced band.

Pure silicon or Germanium have 4 electron in their valenced band. the 4 electrons of penta-valent element material will make covalent bond. and one electron will be considered as free electron.

Therefore, we have free electron at room temperature.



- Q-5 Draw the energy band diagram for P-type semiconductor material and briefly explain its effect at room temperature?





- When pure Silicon or Germanium doped with Tri-valent element which have Tri valenced electron in their valenced band.
- Pure Silicon or Germanium have 4 electron in their valenced band, the 3 electron of tri valent material will make covalent bond with three electron of Silicon or Germanium, and one electron is missing, and it's called hole.
- One atom of impurity makes one hole, in that hole other electron will come and hole is made on other place this process will continued and current will be formed.