

UNIT-9

SOLIDS AND SEMI-CONDUCTORS DEVICES. (ELECTRONICS).

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Qn. What is a solids? Discuss its different types.

Ans → A. Solid :-

Solid is a state of matter having definet shape and volume.

B. Types :-

There are following two types of solid :-

1. Crystalline Solids :-

Crystallines solides are anisotropic substances having fixed melting point their atoms are arranged in proper order.

Crystals may be single crystals, Poly crystals and liquid crystals.

2. Amorphous Solids :-

Amorphous solids are isotropic substances. Their atoms are hazzardly arranged and they do not have a particular melting point but possess the range of softening.

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Qⁿ. what are energy bands in solids? Discuss its different types.

Ans → (A) Energy bands in solids :-

Energy levels of a single atom are definite, but atoms in solid influence each other and therefore energy levels in a solid are affected. They are divided in ~~different~~ different bands.

(B) Types :-

Energy bands in a solid is divided into following bands :-

(1) Valence Band (V.B.) :-

Valence electrons possess a definite energy band called valence band. In other words the highest energy band occupied by valence electrons is called valence band. It is a completely filled band.

(2) Conduction Band (C.B.) :-

All the electrons due to the which the solid can conduct have energies which are said to form a conduction band. The conduction band is an empty band.

13. Forbidden Band (F.B.) Or Forbidden energy gap (F.E.G.) :-

No energy level exists between valence band and conduction band. This is called Forbidden band.

In other words, The separation between conduction band and valence band is called Forbidden energy gap.

Q. Distinguish between conductor, semi-conductors and insulators on the basis of their energy band diagram.

A. 1. conductors (metals) :-

There is an overlapping of ~~two~~ valence band (V) and conduction band (C.B.) in conductors as in the following figure 1 :-