

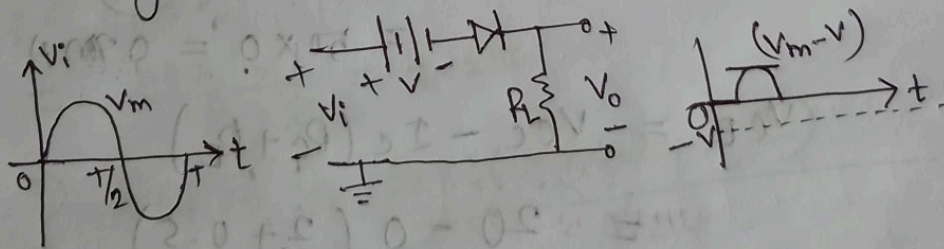
1. what is Semiconductor?

A Semiconductor material has an electrical conductivity value falling between that of a conductor, such as metallic copper, and an insulator such as glass.

2. what is co-valent bond?

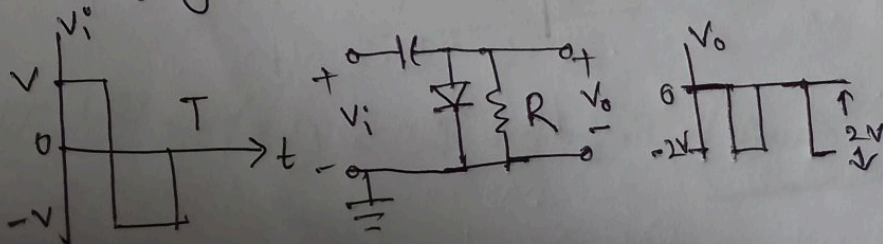
A covalent bond is a chemical bond that involves the sharing of electron pairs between atoms. These electron pairs are known as shared pairs or bonding pairs, and the stable balance of attractive and repulsive forces between atoms, when they share electrons, is known as covalent bonding.

⑨ clippers circuit: clippers are networks that employ diode to "clip" away a portion of an input signal without distorting the remaining part of the applied waveform.



clampers circuit:

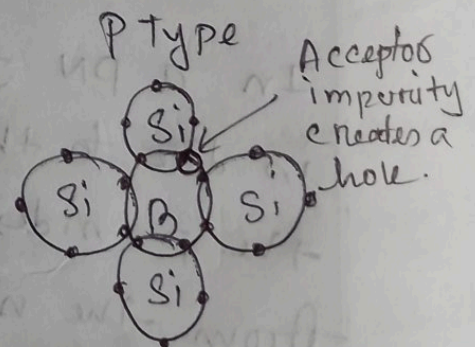
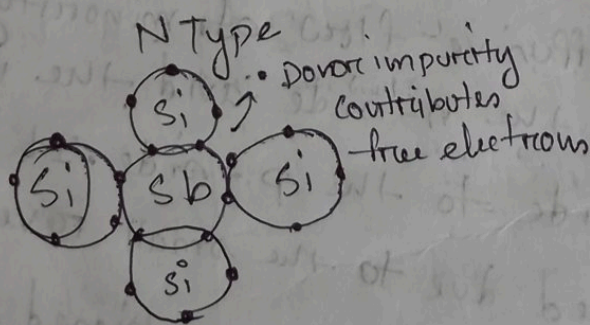
A clamper is a network constructed of a diode, a resistor, and a capacitor that shifts a waveform to a different dc level without changing the appearance of the applied signal.



③ Q. what is semiconductor? How P-type & N-type Semiconductor is formed?

Semiconductors are materials which have a conductivity between conductors and non conductors or insulators. At absolute zero, Semiconductors are perfect insulators, the density of electrons in conduction band at room temperature is not as high as in metals, thus can not conduct current as good as metal. The electrical conductivity of semiconductor is not as high as metal but also not as poor as electrical insulator.

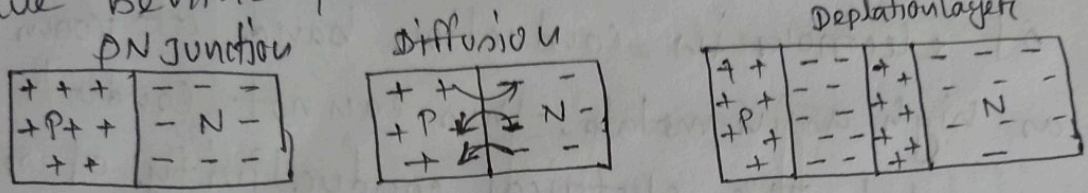
Pentavalent impurities impurity atoms with 5 valence electrons produce n-type semiconductors by contributing extra electrons. Trivalent impurities impurity atoms with 3 valence electrons produce p-type semiconductors by producing a "hole" or electron deficiency.



(A)

7. How depletion layer is formed in PN junction?

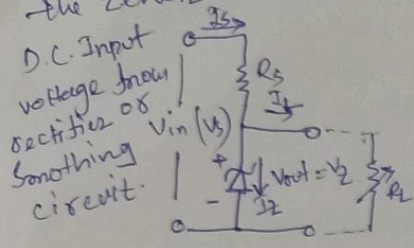
When a p-n junction is formed, some of the free electrons in the n-region diffuse across the junction and combine with holes to form negative ions. In so doing they leave behind positive ions at the donor sides.



8. What is reverse saturation current? How it will be developed
The saturation current (or scale current), more accurately the reverse saturation current, is that part of the reverse current in a semiconductor diode caused by diffusion of minority carriers from the neutral regions to the depletion region. This current is almost independent of the reverse voltage.

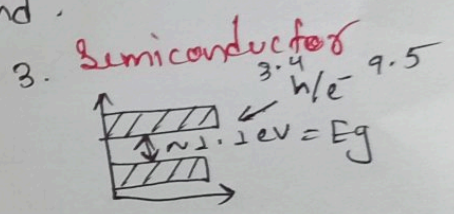
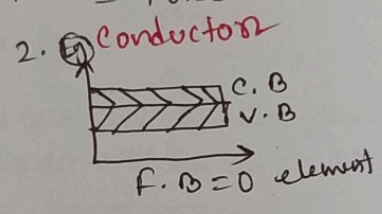
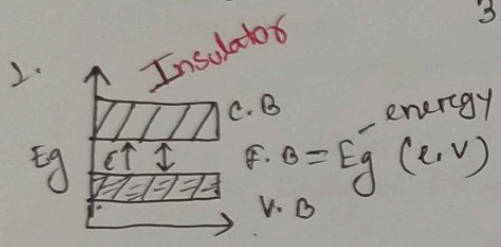
In a PN junction diode, the reverse saturation current is due to the diffusive flow of minority electrons from the p-side to the n-side and the minority holes from the n-side to the p-side. It is a current which is produced due to the small reverse voltage when a PN junction diode is reverse biased.

5) Show that a Zener diode can be used as a voltage regulator?
 Resistor, R_s is connected in series with the Zener diode to limit the current flow through the diode with the voltage source, V_s being connected across the combination. The stabilised output voltage V_{out} is taken from across the Zener diode. The supply voltage, V_s must be greater than V_Z .



Kinds:-

1. C.B = conduction Band
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2. V.B = valance Band.
3. F.B = Forbidden Band.



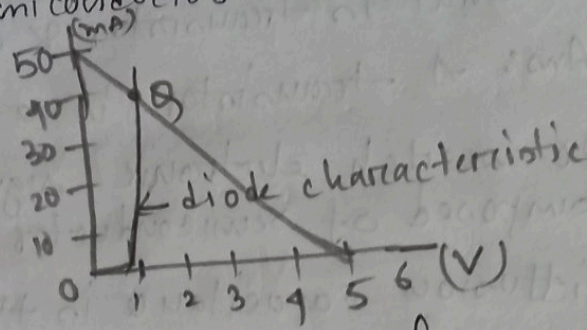
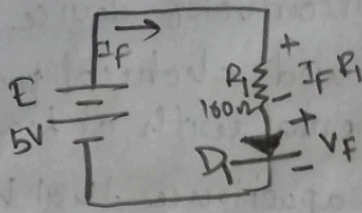
Circuit

rev from 1st to 2nd positive layer



Q3. Load line analysis of Semiconductor Diode?

Ans:



The polarity of E is such that diode is forward biased, so a diode forward current (I_F) flows. As already discussed, the circuit can be determined approximately by assuming a constant diode forward voltage drop (V_F).

Q6. What is PN junction? Different mode of PN junction?

Ans: A P-N Junction diode is a basic semiconductor device that controls the flow of electronic current in a circuit. It has a positive side (P) and negative side (N). To make a P-N junction diode.

Zero Bias: No external voltage potential is applied to the PN junction diode.

Reverse Bias: The voltage potential is connected negative (-ve) to the P-type material and positive (+ve) to the N-type material across the diode which has the effect of increasing the PN junction diode's width.

Forward Bias: The voltage potential is connected positive (+ve) to the P-type material and negative (-ve) to the N-type material across the diode which has the effect of decreasing the PN junction diode's width.

transport of charge carriers.
a device, for example, the diffusion of carriers anode
to cathode in a forward biased diode.

② what is Zener diode & draw the characteristic curve of Zener diode?

A Zener diode is a special type of diode designed to reliably allow current to flow "backwards" when a certain set reverse voltage, known as the Zener voltage, is reached.

