in alack of free carriers in the region near the Junction, called depletion region due to the "depletion" of free carriers in the region.

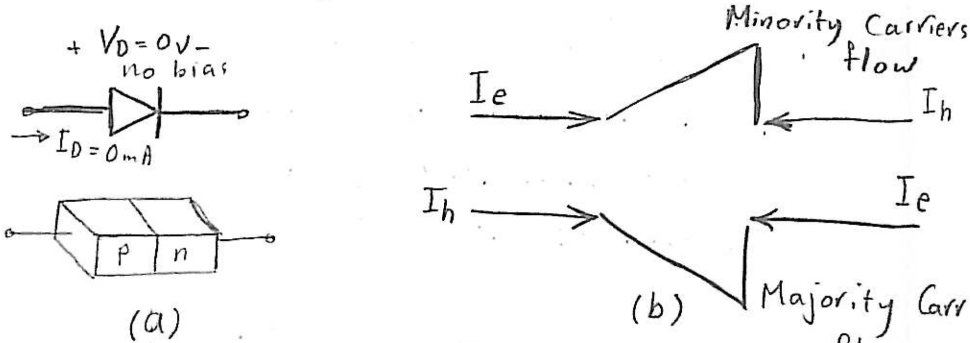

Fig (1-11)

a) adiode Symbol with the defined polarity and th current direction

b) demonstration that the net carrier flow is Zer at the external terminal of the device when $V_D =$

* The majority carriers (electrons) of the n-type material must overcome the attractive forces of the layer of positive ions in the n-type material and the shield of negative ions in the p-type material, asmall number of majority carriers with sufficient kinetic energy to pass through the depletion region.

Again, the same type of discussion can be applied to the majority carriers (holes) of the p-type material.

* In the absence of an applied bias across asemiconductor diode, the net flow of charge in one direction is Zero.

Reverse - Bias Condition ($V_D < 0V$)

* If an external potential of V volts is applied across the p-n junction such that the positive terminal is connected to the n-type material and the negative terminal is connected to the p-type material. as show in Fig (1-12)

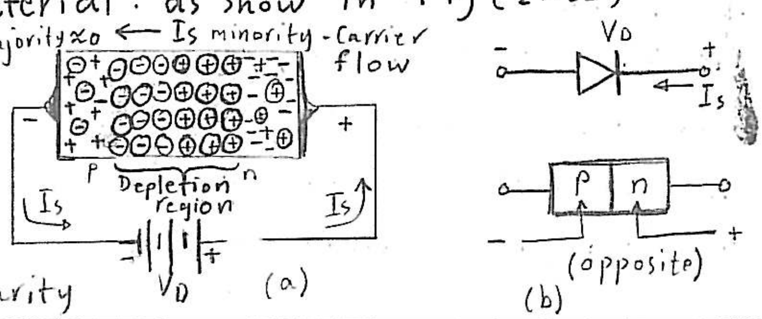

Fig (1-12) Reverse-biased p-n Junction a) Internal distribution of charge under reverse-biased conditions b) reverse-biased polarity and direction of reverse saturation current.