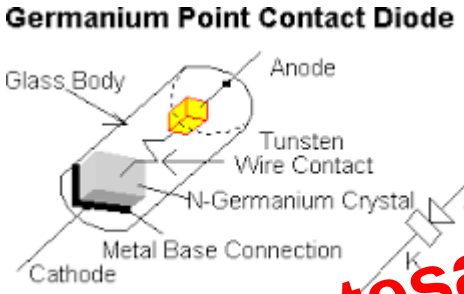
Q(30). Compare zener diode & P-N junction diode?.

P-N Junction Diode	Zener Diode
(i). Mainly designed to operate in forward bias mode.	(i). Mainly designed to operate in reverse bias mode.
(ii). Used in rectifiers & voltage multiplifiers.	(ii). Used in voltage regulators & voltage limiters.
(iii). It has no sharp reverse breakdown.	(iii). It has sharp reverse breakdown.
(iv). It will damage easily if applied voltage exceeds breakdown voltage.	(iv). It will not damage if applied voltage exceeds breakdown voltage.
(iii). Symbol.	(iii). Symbol.
(iv). V-I characteristics.	(iv). V-I characteristics.

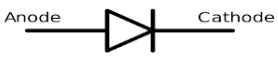
Q(31).Describe the working principle & construction of point contact diode?.



(i). It can be defined as the diode in which the junction is formed between tungsten wire and N type semiconductor. (ii). It consists of N type semiconductor, tungsten wire, ceramic glass encapsulation and a contact point. (iii). There is a N type semiconductor crystal which is made up of either silicon or germanium material. (iv). This crystal is mounted on base.

(vi). There is point contact attached with this base. (vii). This point contact is so smaller than the cross sectional area of the wire. (viii). A connection is taken out in terms of cathode. (ix). Anode is connected with tungsten wire. (x). Hence these total materials are placed in ceramic or glass capsule also called as encapsulation. (xi). This tungsten wire is coated with indium material which acts as a accepter impurity. (xii) .Hence by this way there is a formation of P-N junction in between tungsten wire & N-type semiconductor.

Q(32). Draw the symbol of point contact diode?.

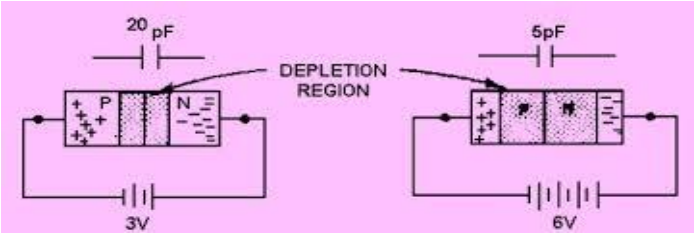


Q(33). State applications of point contact diode?.

(i). In radio receivers. (ii). As a video detectors, (iii). In frequency mixer, (iv). In pulse circuits.

Q(34). Draw the symbol of schottky diode?.

Q(47). Explain the working principle of varactor diode?.



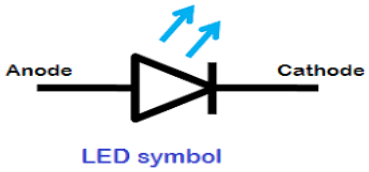
Construction:- (i). As seen from the above diagram, holes are majority charge carriers in P-type semiconductor material and electrons are majority charge carriers in N-type semiconductor material. (ii). There is a neutral space charge region (Junction) between these two which do not have any majority carriers. (iii). There are two plates in the capacitor between which there is a dielectric material.

Working:- (i). The diode is operated under reverse bias conditions and this gives rise to three regions. (ii). At either end of the diode are the P and N regions where current can be conducted. (iii). However around the junction is the depletion region where no current carriers are available. (iv). As a result, current can be carried in the P and N regions, but the depletion region is an insulator.

(v). The capacitance of a capacitor is dependent on a number of factors including the plate area, the dielectric constant of the insulator between the plates and the distance between the two plates. (vi). In the case of the varactor diode, it is possible to increase and decrease the width of the depletion region by changing the level of the reverse bias voltage. (vii). If the distance between the two plates of capacitor is increased then its capacitance reduces.

(viii). Opposite to it, if distance between the two plates is reduced than dielectric between them will also reduce and due to which its capacity increases. (ix). When varactor diode is reverse biased, then the neutral region between P and N layers increases and when the reverse biasing is decreases then this neutral region is also decreased. (x). Finally, it is concluded that diode also has the capacity like a capacitor. (xi). Varactor diodes are available from 20 pF To 500 pF value.

Q(48). Draw symbol of LED (Light Emitting Diode)?.



LED symbol

Q(49). Explain working principle & constructional details of LED?.