DPP 02

SOLUTION

Link to View Video Solution: Click Here

1. As we know current density, $J = nqv$

$\Rightarrow J_e = n_e q v_e$ and $J_h = n_h q v_h$

2. The barrier potential depends upon temperature, forward bias and doping density.

3. $E = \frac{V}{d} = \frac{0.5}{5\times10^{-7}} = 10^6$ V/m

4. All others have cathode at higher potential than anode.

5. In forward biasing, both positive and negative charge carriers move towards the junction.

6. Because P-side is more negative as compared to N-side.

7. In forward biasing, resistance of PN Junction diode is zero. So whole voltage appears across the resistance.

8. In the given condition, diode is in reverse biasing. So it acts as open circuit. Hence potential difference between A and B is 6V.

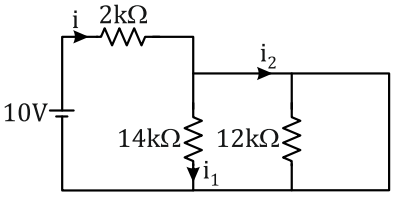
9. Since diode in upper branch is forward biased and in lower branch is reversed biased. So current through circuit $i = \frac{V}{R+r_d}$; here r_d = diode resistance in forward biasing = 0

$\Rightarrow i = \frac{V}{R} = \frac{2}{10} = 0.2$ A

10. The diode in lower branch is forward biased and diode in upper branch is reverse biased.

$\therefore i = \frac{5}{20+30} = \frac{5}{50}$ A

11. The equivalent circuit can be redrawn as follows:



$i = i_2 = \frac{10}{2} = 5$ mA and $i_1 = 0$