Name :→ Zala Divy Buldevbhai
Roll no. :→ A045
Add no. :→ U20CS045
Tutorial :→ 2

(7) diffusion const. $= 13\,cm^2/sec$

gradient $= \frac{dp}{dx} = -2\times10^{14}$ holes/$cm^3$/cm

$$J_p = -eD_p\frac{dp}{dx}$$

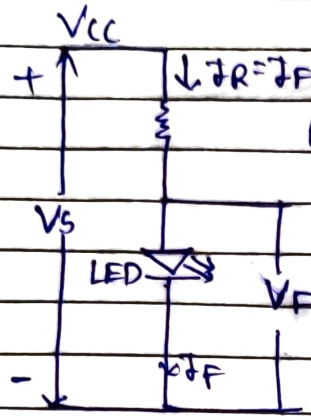
$$= 1.6\times10^{-19}\times 13\times -2\times10^{14}$$

$$= 41.6\times10^{-5}$$

$$\boxed{J_p = -4.16\times10^{4}}$$

Tut:-2

(2)




(i) $V_F = 2V$

$I_F = 10mA$

$V_S = 5V$

$\therefore R_S = \frac{5-2}{10mA} = \frac{3}{10^{-2}} = \underline{300\Omega}$

(ii) $V_F = 2V$

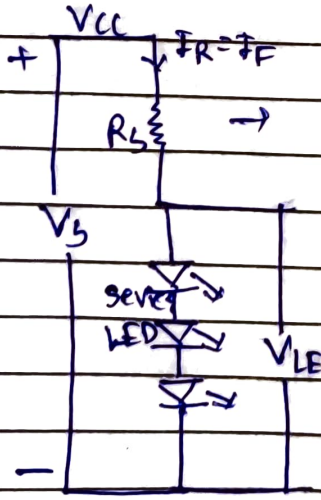
$V_S = 5V$

$I_F = ?$

$R_S = 100\Omega$

$I_F = \frac{V_S - V_F}{R_S} = \frac{3}{100} = \underline{30mA}$

(3)



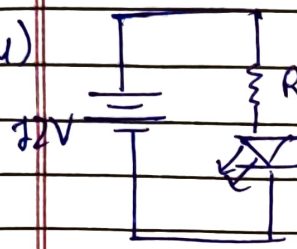
$V_{LED} = 3.6V$

$R_S = \frac{V_S - V_{LED}}{I_F}$

$= \frac{5 - 3.6}{10\ mA}$

$R_S = 140\ \Omega$

(4)




LED forward voltage = 2.9V

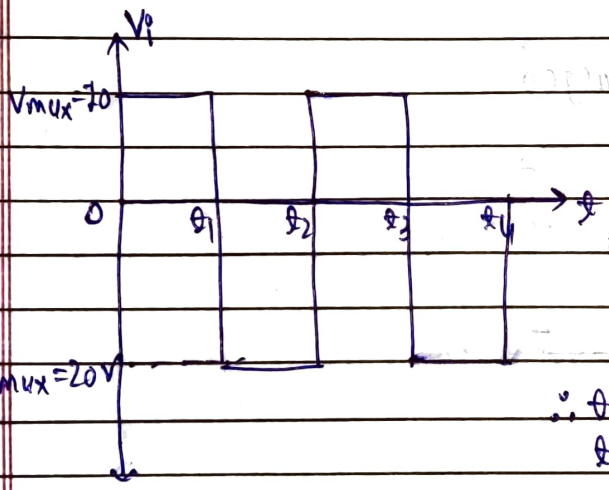
LED forward current = 11400mA

$\therefore P = VI_F$

$= 8.1 \times 1.4$

$P = 11.34$ MWatts

(5)

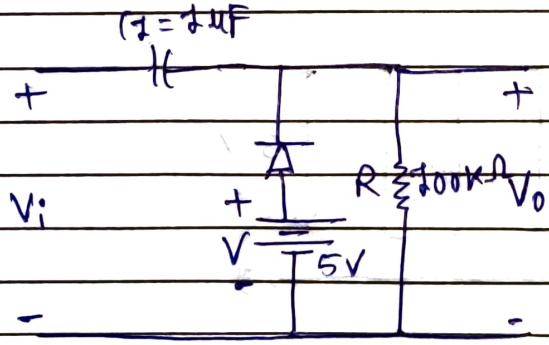



$T = 1/f = 1/1000$

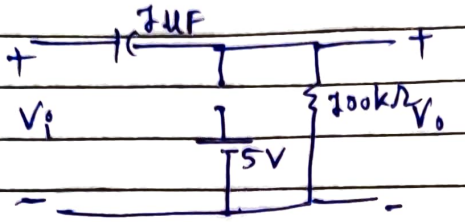
$T = 1\ msec$

$\therefore t_1 = 0.5\ ms$

$t_2 = 0.5\ ms$

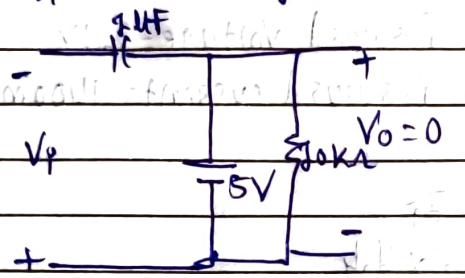


(i) $V_i$ is $\rightarrow 0 < t < t_1 \Rightarrow V_i = 10\,V$




$I_0 = 0 \Rightarrow V_0 = 0V$

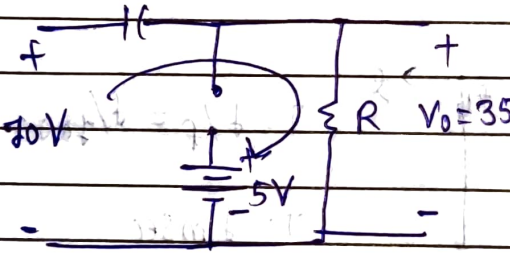
(ii) $V_i$ is $\Rightarrow t_1 < t < t_2 \Rightarrow V_i = -10\,V$




(iii) $V_i$ is $\Rightarrow t_2 < t < t_3$

$V_c = 25\,V$

when it gets discharged




Output $\Rightarrow$