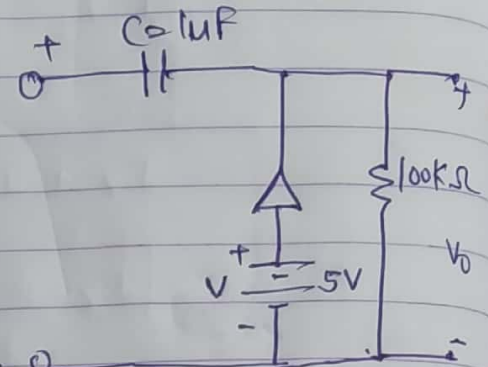
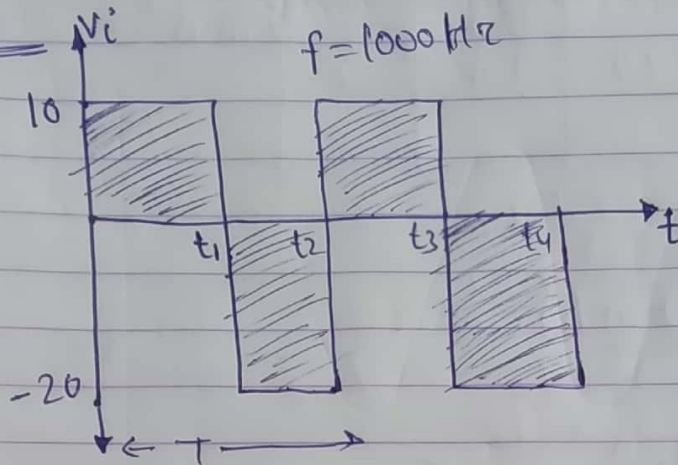


DELD Practice Sheet - 2

B110 Krishna Pandey
U20CS110

Sol-1



① when input rises from 0 to 10V, mean $0 < t < t_1$

$$I_D = 0 \Rightarrow V_O = 0V \text{ [diode in RB]}$$

$$V_i = 10V$$

$$T = \frac{1}{f} = \frac{1}{1000} = 1 \text{ msec}$$

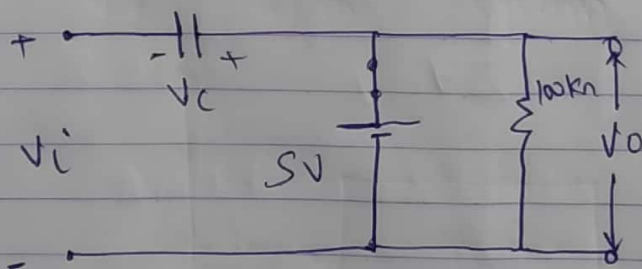
$$t_1 = t_2 = 0.5 \text{ msec}$$

$$\tau = RC > 0.1$$

clearly $t_1 \ll \tau$

② $t_1 < t < t_2$

Diode will be in FB



$$V_O = 5V$$

$$V_e = 5 - (-20)$$

$$= 25V \text{ [Capacitor]}$$

(iii)

$$t_2 < t < t_3$$

Again diode in RB

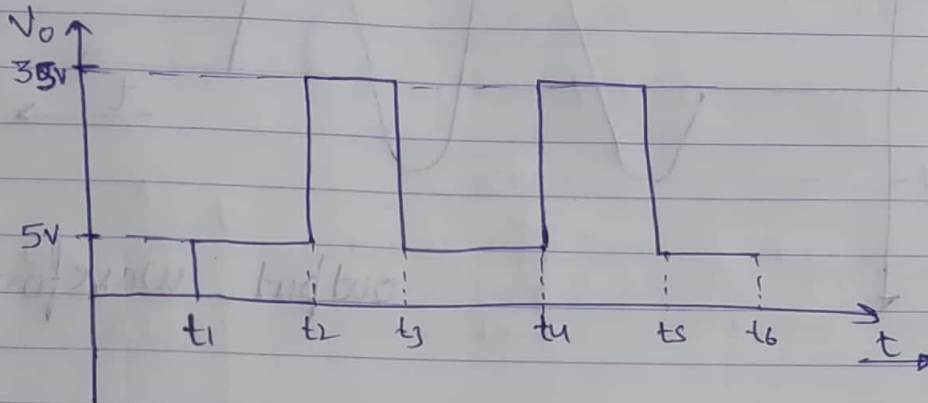
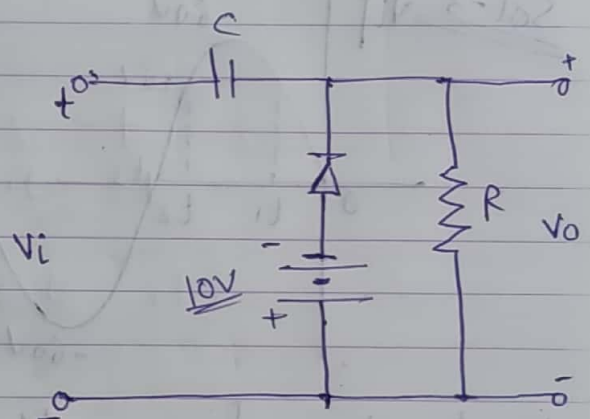
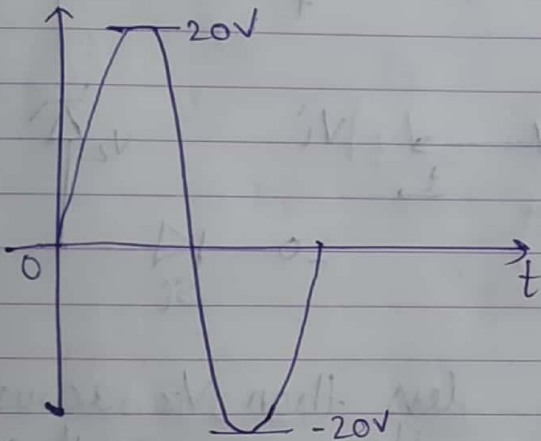
acc. to KVL

$$V_c - V_o = 0$$

$$V_o = 25 + 10$$

$$V_o = 35V$$

∴ output waveform

Sol-2

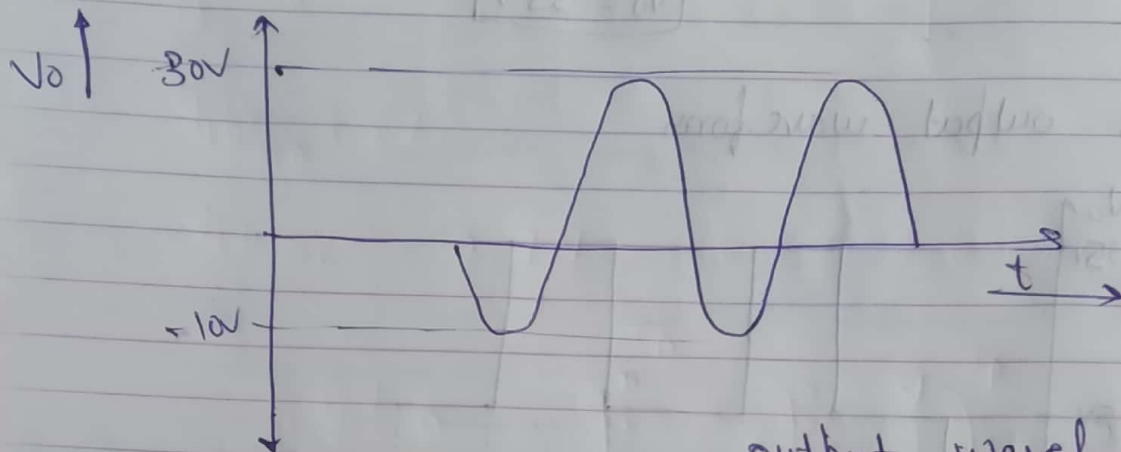
$$\tau = RC \gg t$$

- This circuit is +ve clamper with -ve ref of 10V
- For the 1st +ve half cycle, diode will be RB
 $\therefore V_o = 0$ as $i = 0$ due to charging capacitance
- For the 1st -ve half cycle diode will be FB
 $V_o = 10V$ and capacitor will be charged to 10V

After 1 complete cycle capacitor will provide dc volt of $10V =$

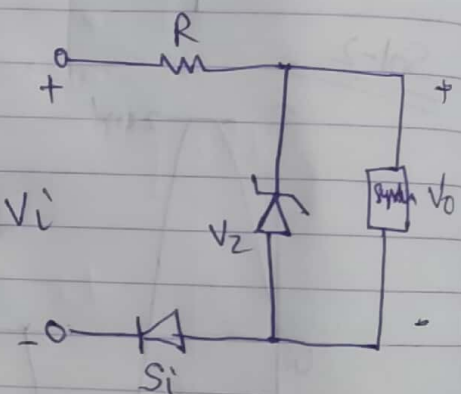
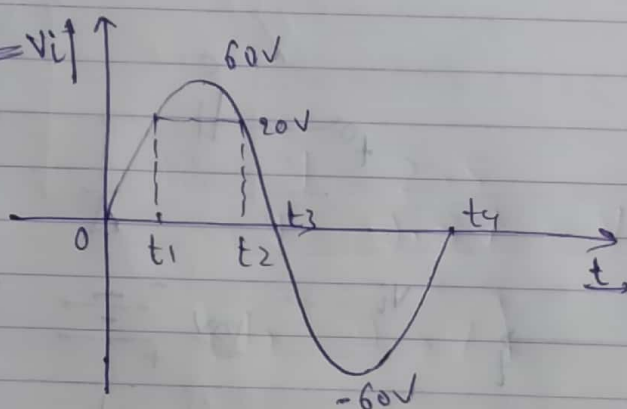
$$V_{max} = 10 + 20 = 30$$

$$V_{min} = 10 + (-20) = -10$$



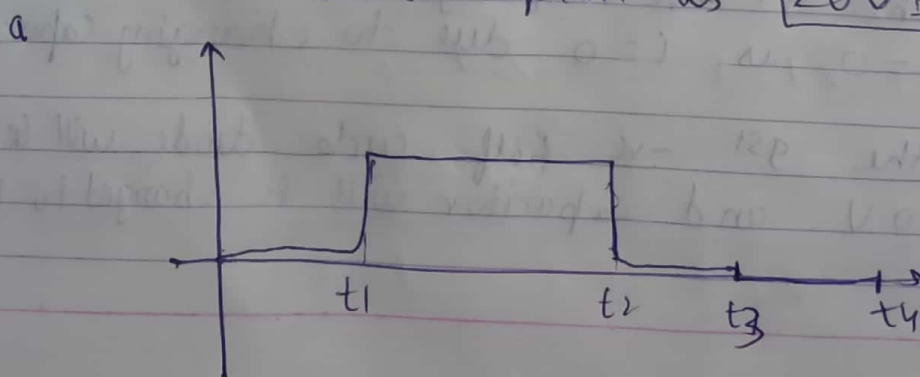
output waveform

Sol-3 V_i



* clearly for voltage less than V_Z across zener diode it will provide very small current & hence very small voltage

* when $V_i > 20$ it will provide constant V_Z across system as $20V = V_Z$



* and $V_o = 0V$ when V_i is $-ve$ since Si diode will be R.B so open circuit hence no current flows in circuit

Sol-4

green LED

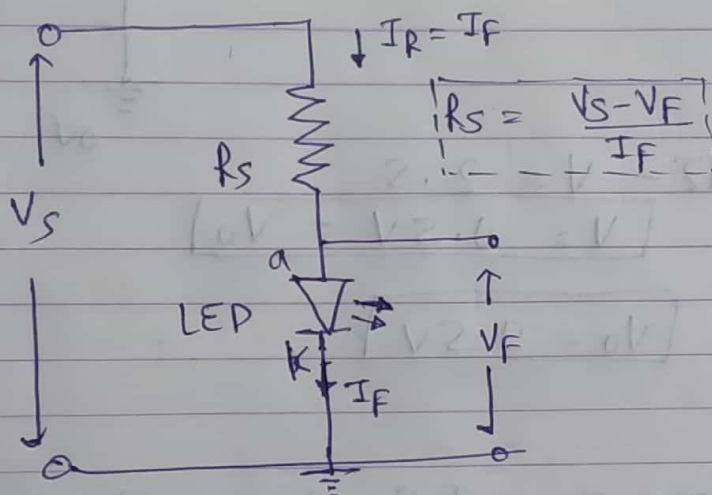
$$\lambda_n = 5490 \text{ \AA}$$

$$E = \frac{12400 \text{ eV}}{\lambda(\text{\AA})}$$

$$= \frac{12400 \text{ eV}}{5490}$$

$$E = 2.258 \text{ eV}$$

Sol-5



$$V_S = 10V$$

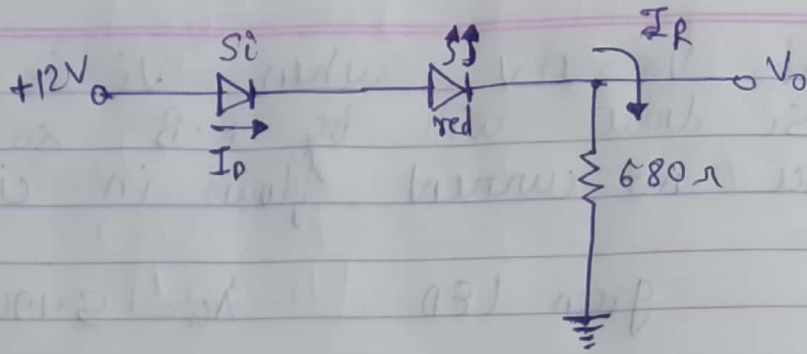
$$V_F = 1.6V$$

$$I_F = 20 \text{ mA}$$

$$R_S = \frac{10 - 1.6}{20 \text{ mA}}$$

$$R_S = 420 \Omega$$

Sol-6

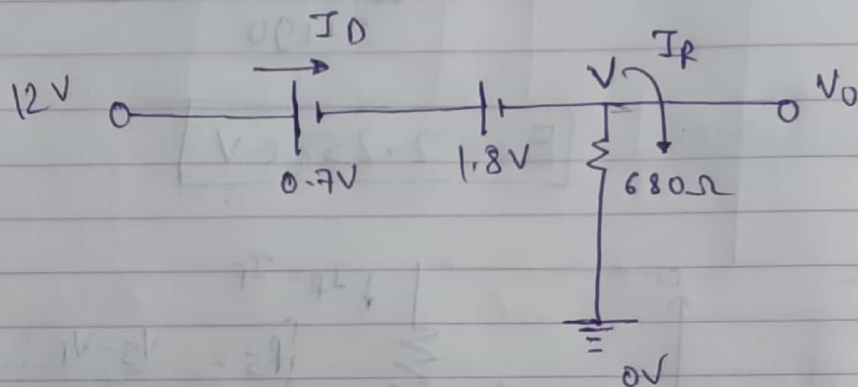


$$V_0 = ?$$

$$I_D = ?$$

$$(V_{FD})_{LED} = 1.8V$$

$$(V_{FD})_{Si} = 0.7V$$



$$12 - V = 2.5$$

$$V = 9.5V = V_0$$

$$V_0 = 9.5V$$

$$I_D = \frac{9.5 - 0}{680} = 13.97mA$$

$$I_D = 13.97mA$$

END