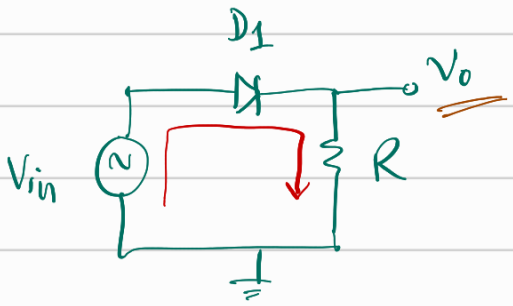
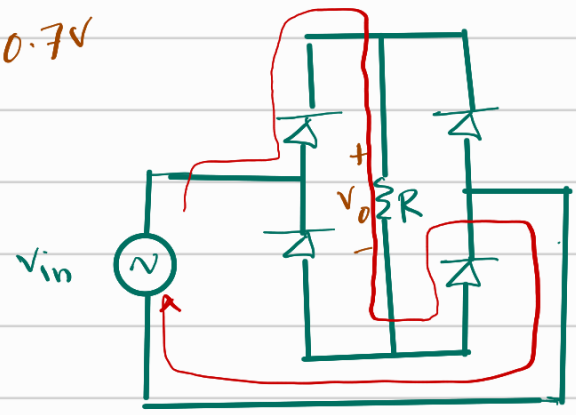
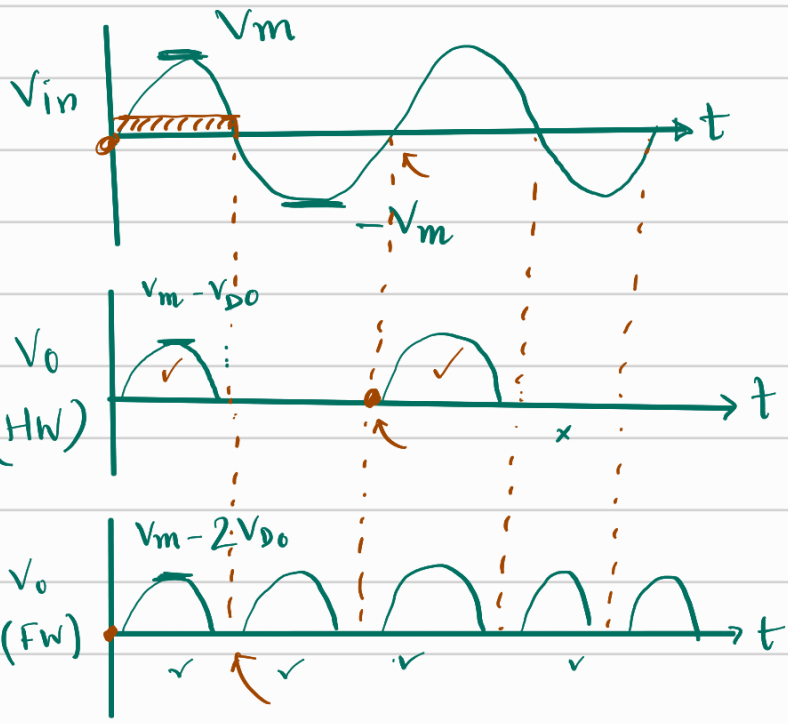
HW & FW Rectifier :-



$V_{D0} = 0.7V$





$V_{in} = 5\sin(200\pi t) \rightarrow f_s = 100Hz$

$A\sin(2\pi f t)$

HW

$f_r = f_s$; $V_{DC} = \frac{1}{\pi} V_m - \frac{1}{2} V_{D0}$

$\max\{V_{in}\}$

FW

$f_r = 2f_s$;

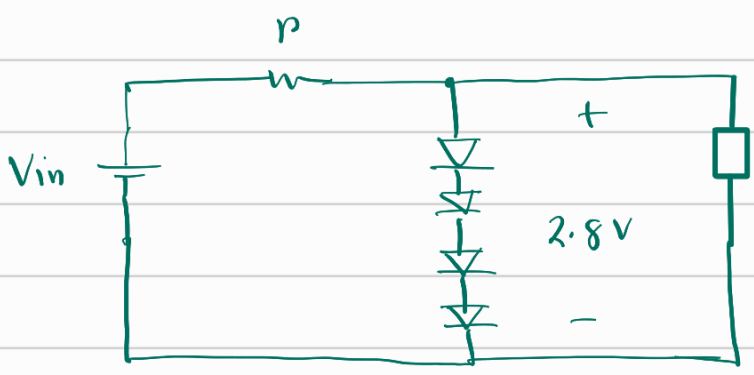
$V_{DC} = \frac{2}{\pi} V_m - 2V_{D0}$

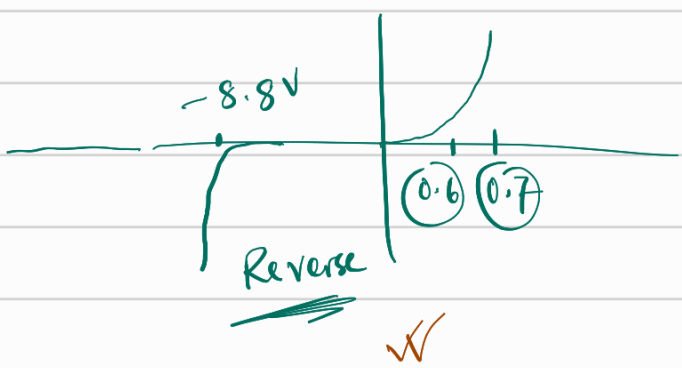
$\max\{V_{in}\} = V_m$

$\max\{V_o\} = V_p = \begin{cases} V_m - V_{D0}, & HW \\ V_m - 2V_{D0}, & FW \end{cases}$

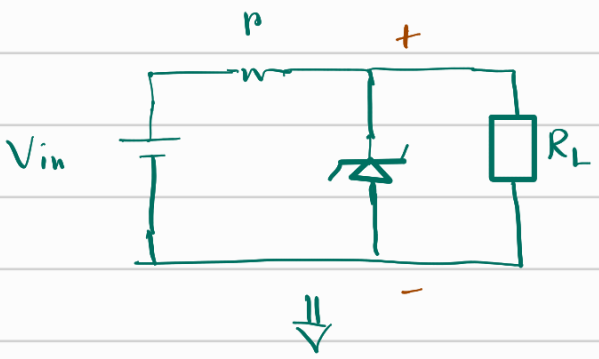
Regulation/tor

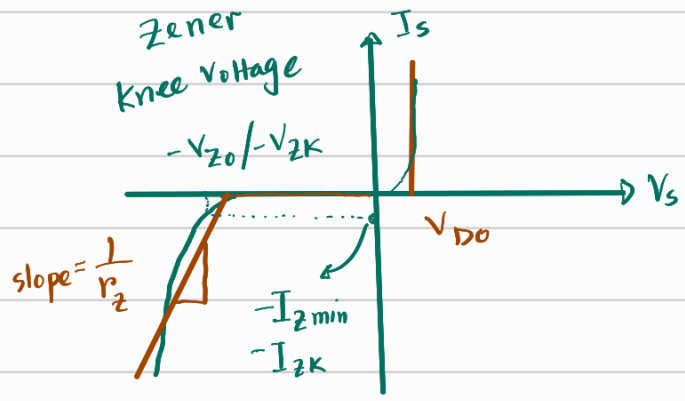
220V (AC) → 24V (AC) → 18V (DC).



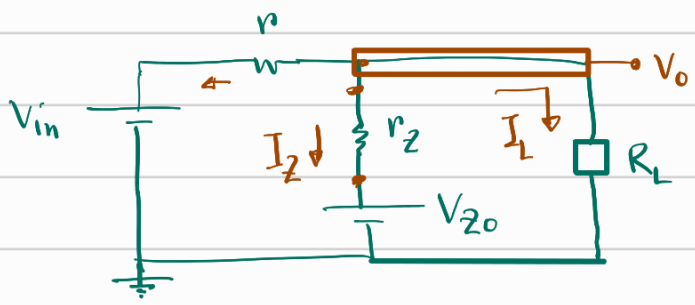


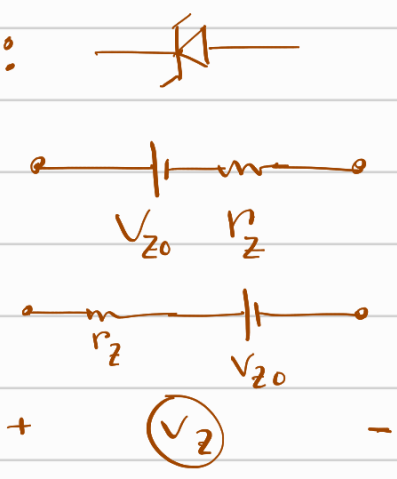
Zener diode.





CVD+R :





$$\frac{V_o - V_{in}}{r} + I_z + I_L = 0$$

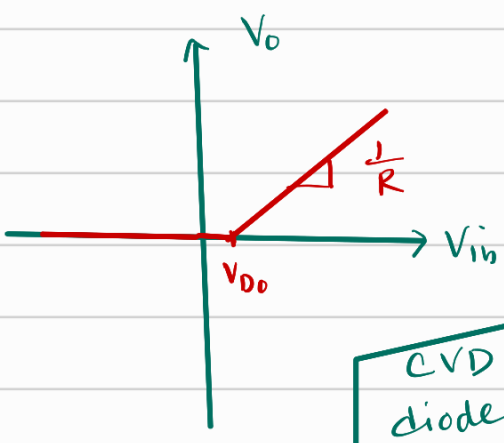
$$\frac{V_o - V_{in}}{r} + \frac{V_o - V_{zo}}{r_z} + \frac{V_o}{R_L} = 0$$

$$V_z = V_{zo} + I_z r_z$$

VTC

HW

FW



CVD diode

$V_{DO} = 0V$ → ideal diode