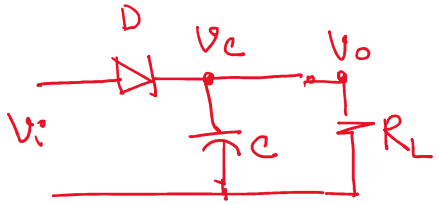
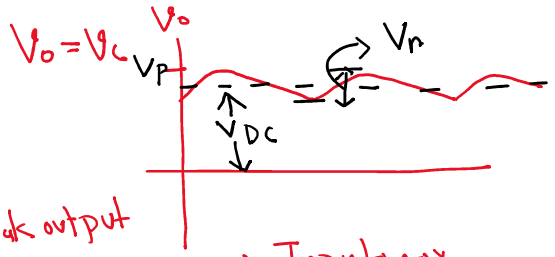




$V_r = \frac{V_p}{fCR_L}$, $V_r = \frac{V_p}{2fCR_L}$

Peak output → Input max

$V_p = V_m - V_D$ [H.W.R]

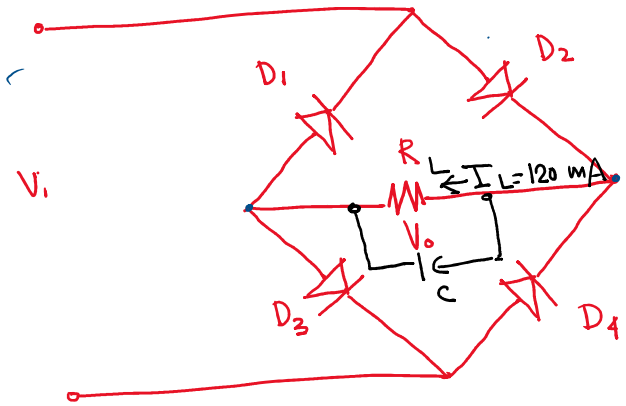
$V_p = V_m - 2V_D$ [F.W.B.R]

$V_p = V_m - V_D$ [F.W.C.T]

Ripple factor: $\frac{V_r(p\text{-}p)}{V_{DC}}$

$V_{DC} = V_p - V_r/2$

Design a F.W Rectifier, that delivers peak current $I_L(p) = 120\,mA$ to a Load R_L, peak output voltage $V_p = 12V$, $V_r \leq 5\%$ of Input max (V_m) $f = 50\,Hz$. R_L & C.?



$R_L = \frac{V_p}{I_L(p)} = \frac{12V}{120\,mA} = 100\,\Omega$

, $V_r \leq 5\%$ of V_m

$V_r = 0.04 V_m$

$V_p = V_M - 2V_D$

$\Rightarrow V_M = V_p + 2V_D = 12 + 2\times0.7 = 13.4V$

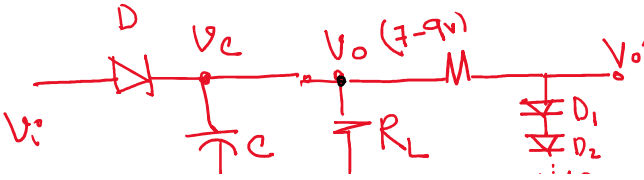
$V_r = 0.04 \times 13.4$

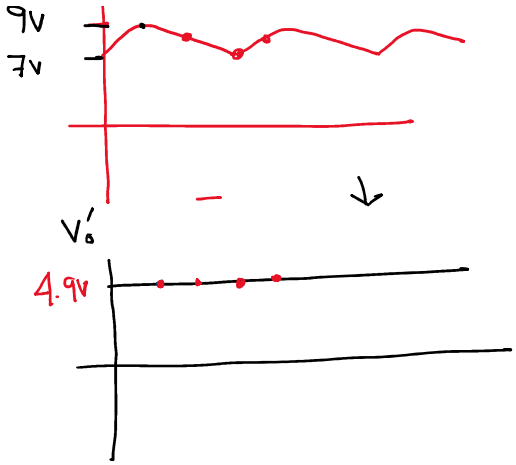
$V_r = \frac{V_p}{2fCR_L} \Rightarrow 0.04 \times 13.4 = \frac{12}{2\times50\times100\times C}$

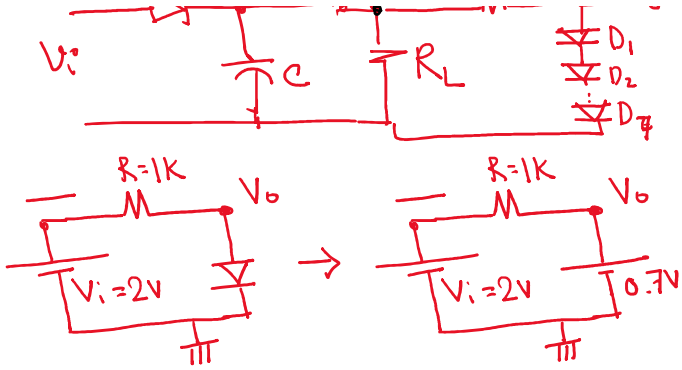
$C = \ldots\ldots$

$V_{DC} = V_p - V_r/2$

$R.F = \frac{V_p}{V_{DC}}$







Zener diode 

V_Z=5V (Breakdown Voltage)

R.B. $V_i > V_Z$