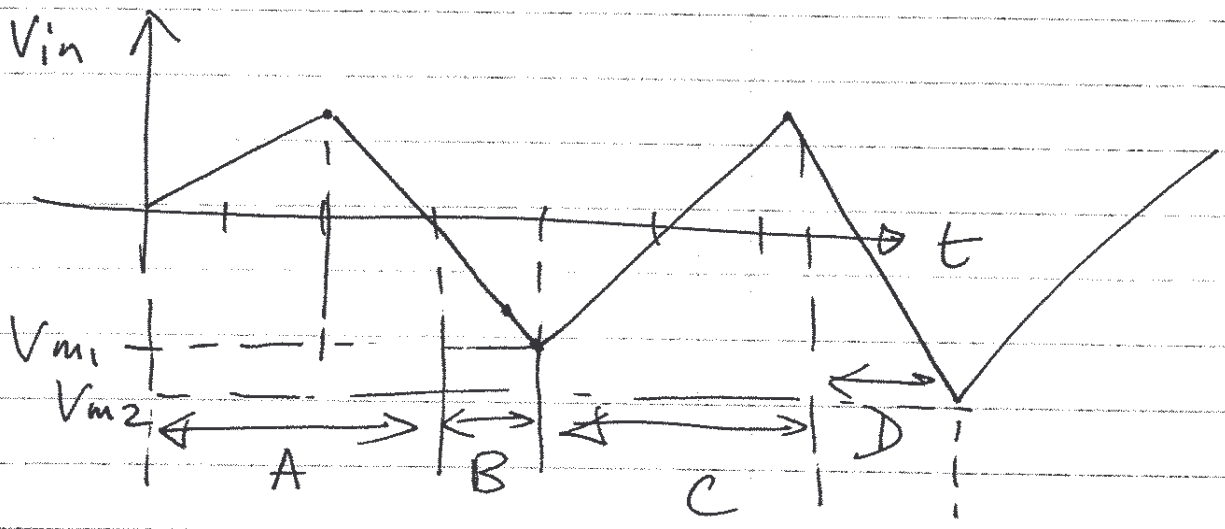
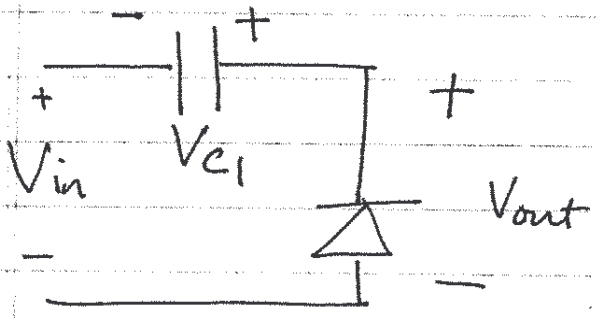


④ Level Shift CKT (notes Lec. 17-18, slide 50)



① In duration A, V_{in} is positive, Diode is off. No current I_D .

Eq (1) $\therefore V_{in} - V_{out} = -V_{c1}$

$V_{c1} = 0$ \therefore No current charging it

$\Rightarrow V_{in} = V_{out}$

② duration B, Diode is turned on Capacitor is charged, The ideal diode mode $V_D = -V_{out} = 0$.

But $V_{c1} = -V_{in}$

(3) Duration C

Suddenly $V_{in}|_C = V_{in}|_B + \delta$ δ is positive

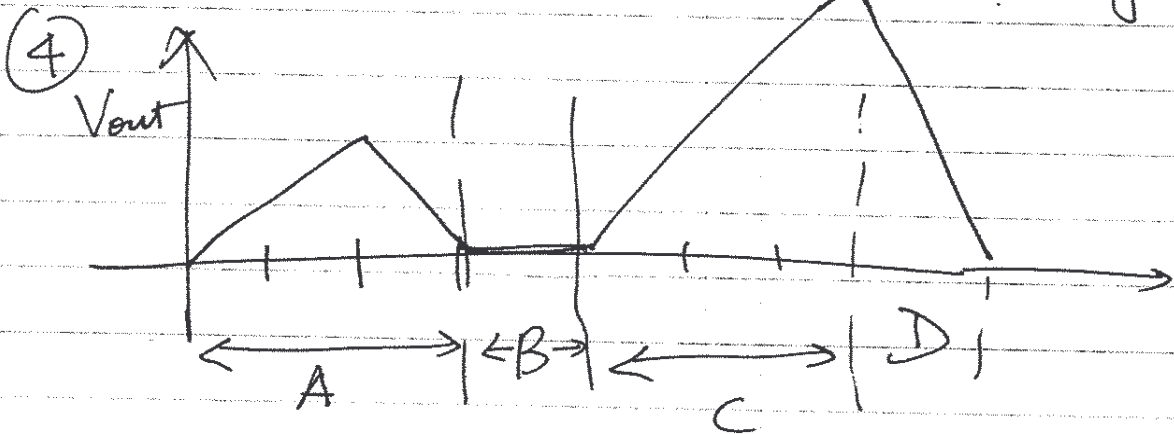
$V_{in}|_C = -V_{C1} + \delta$ V_{C1} doesn't change instantaneously

From Eq (1) $V_{out} = V_{in} + V_{C1}$

$\therefore V_{out}|_C = V_{in}|_C + V_{C1}|_C$
 $= -V_{C1}|_C + \delta + V_{C1}|_C$

\therefore Diode is turned off.
 $I_D = 0$

V_{out} follows V_{in} but shifted by $V_{C1}|_B = C$



If $V_{m2} < V_{m1}$ then Diode can be turned on again \rightarrow Capacitor will be charged to V_{m2} value & shift up.