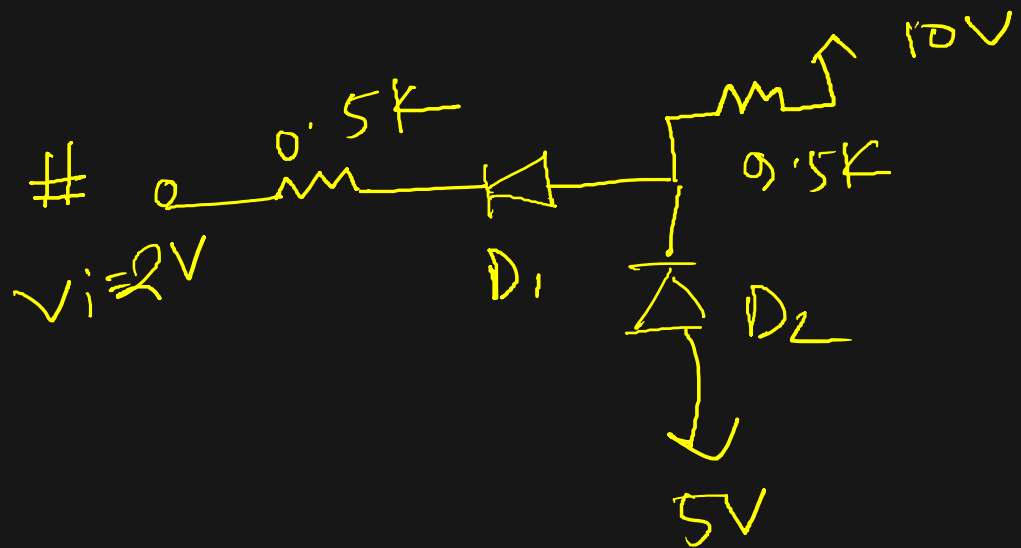
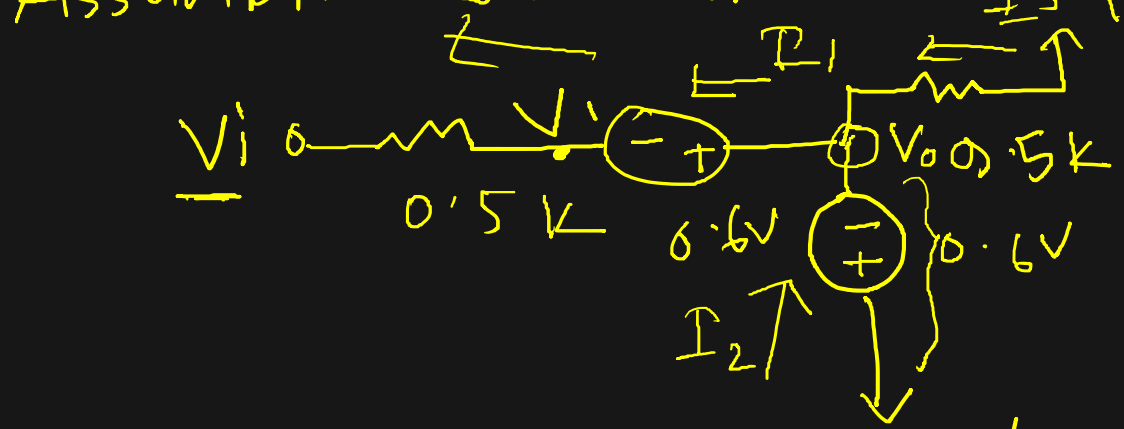
Lecture 8+9



Use CVD model, $V_{D_o} = 0.6V$

i) $V_i = 2V$, ii) $V_i = 13V$

Assumption 1: Both ON



$5 - V_o = 0.6\ V$

$\Rightarrow V_o = 4.4V$

$V_1 = V_o - 0.6V$

$= 3.8V$

$I_3 = \frac{10 - V_o}{9.5}\ mA$

$= 0.6\ mA$

$I_1 = \frac{V_1 - V_i}{0.5K}$

$= \frac{1.8}{0.5}\ mA$

$= 3.6\ mA$

KCL at V_o : $I_1 = I_2 + I_3$

$\Rightarrow I_2 = I_1 - I_3$

$= 3\ mA$

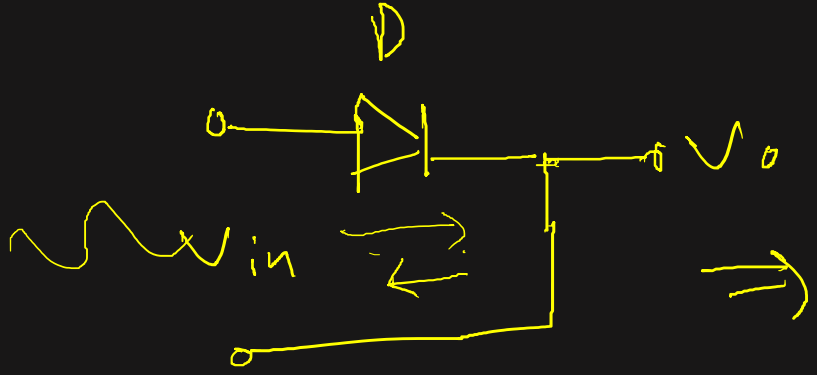
I_1, I_2 both positive

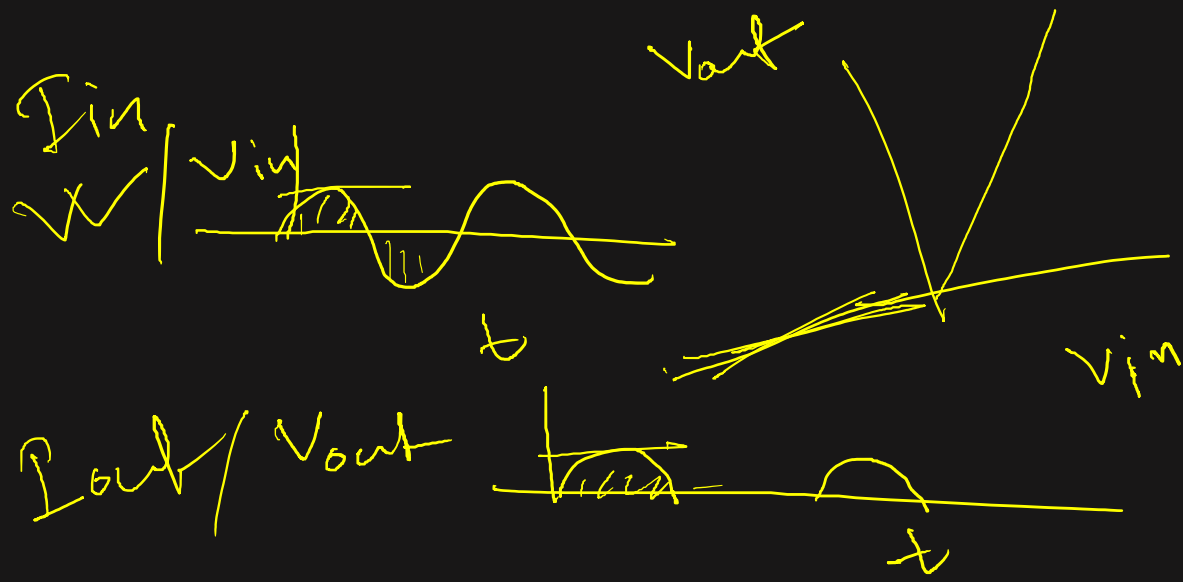
$\therefore$ Assumption Correct

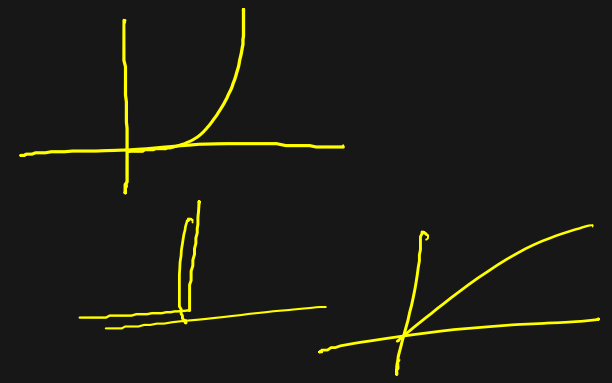
Practice: $\boxed{V_i = 13V}$

—— X ——

Rectifier







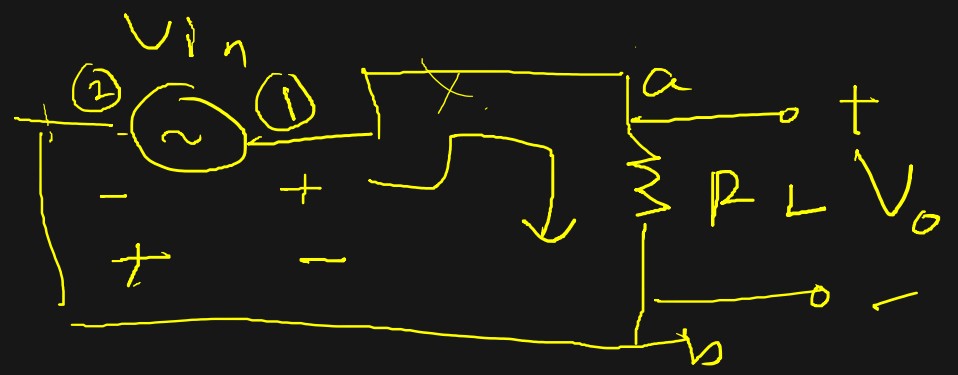
Three types

1) I-V curves → Device / element (I_D vs V_D)

2) Transfn characteristic → Circuit (out · Vs Inp)

3) Waveform (V / I vs t)

#


Vin
2
1
a
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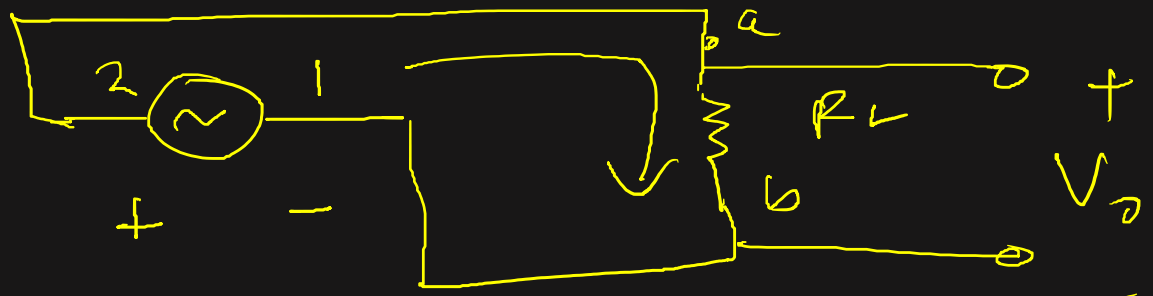
2
1
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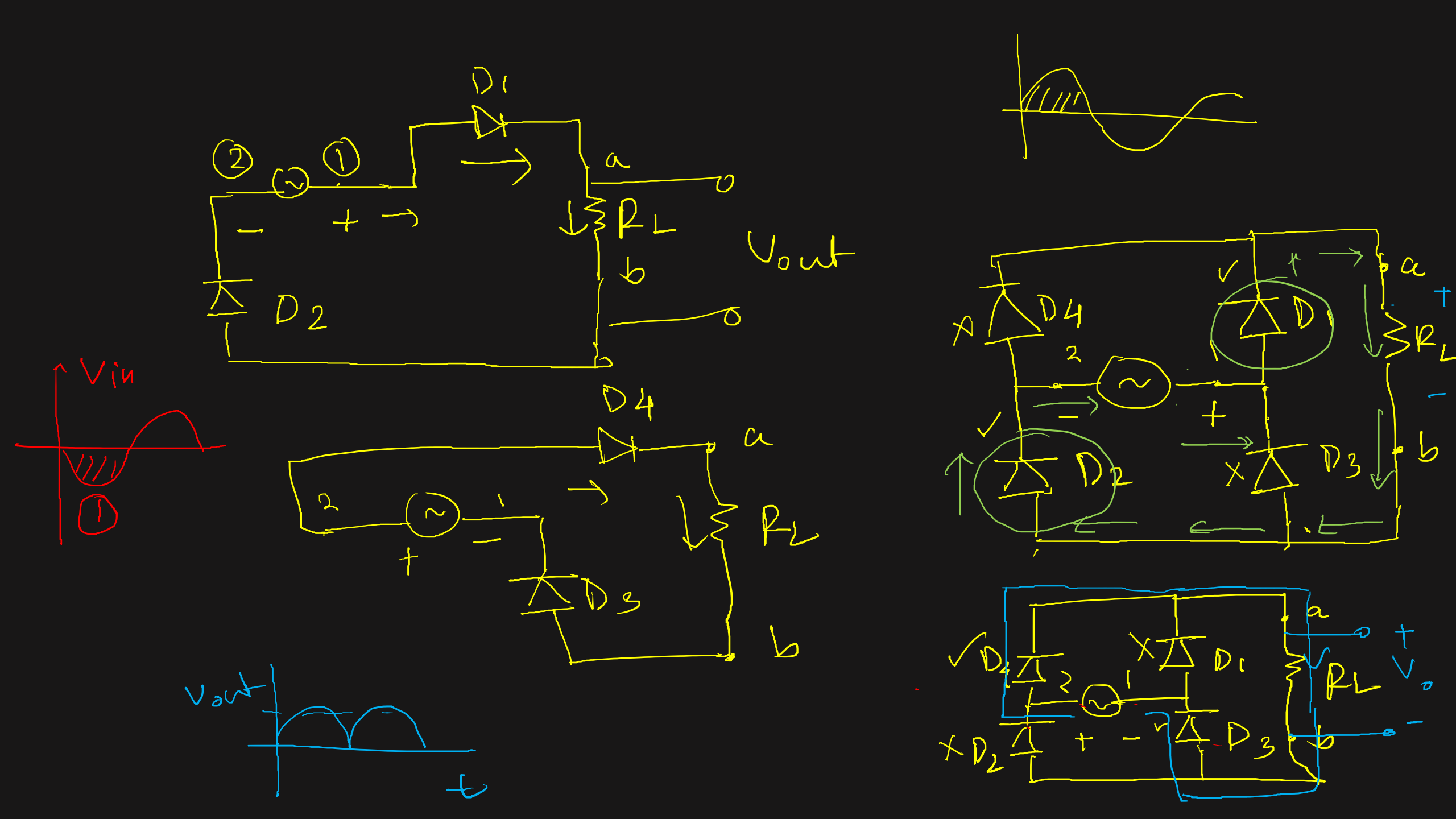
D1
D2
D3
D4
a
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Vout
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D4
D1
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RL
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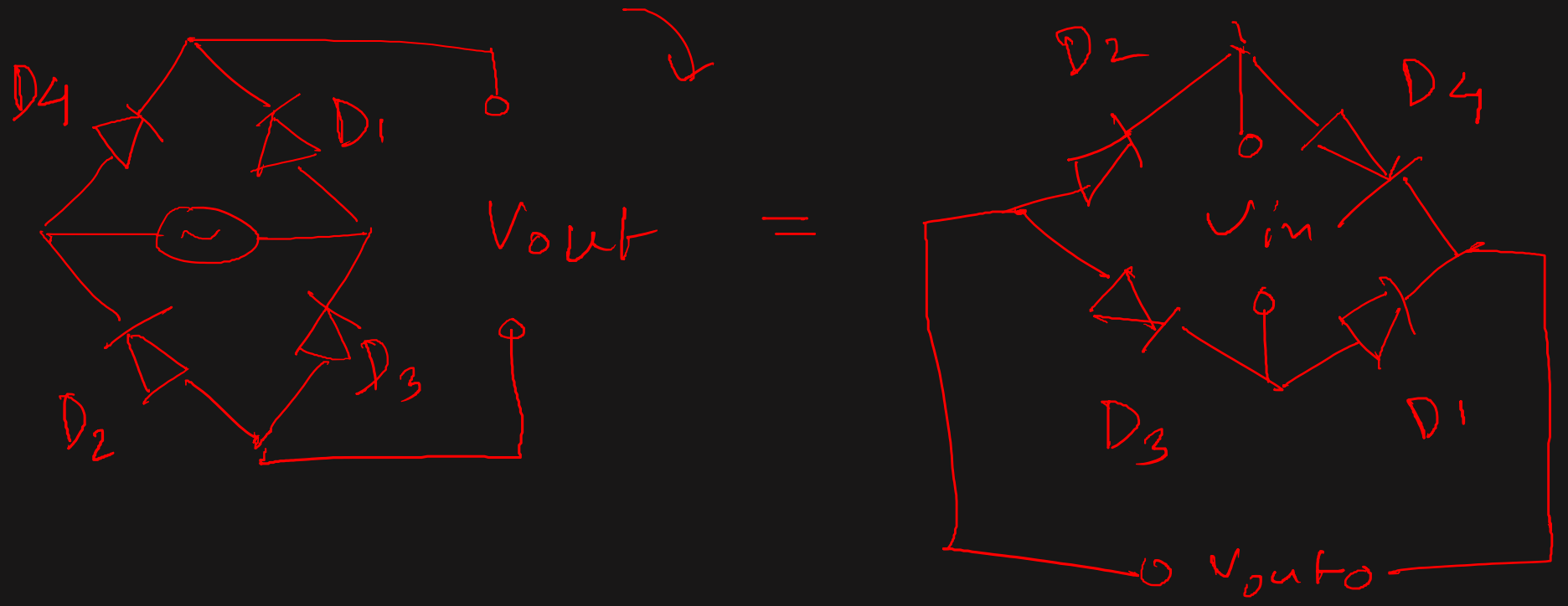
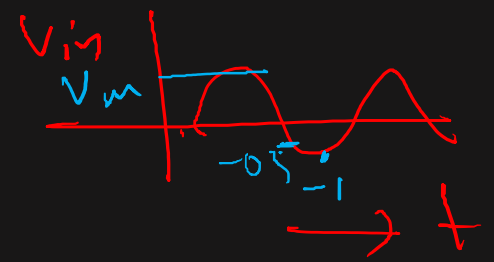
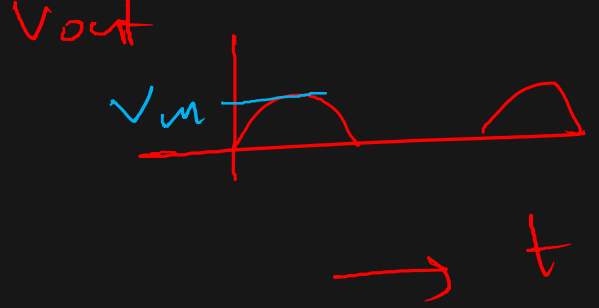
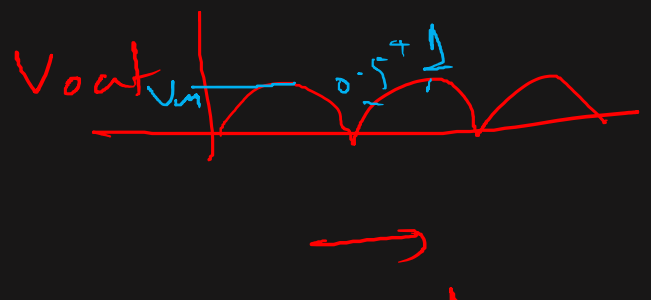
D4
D1
D2
D3
RL
a
b
Vo

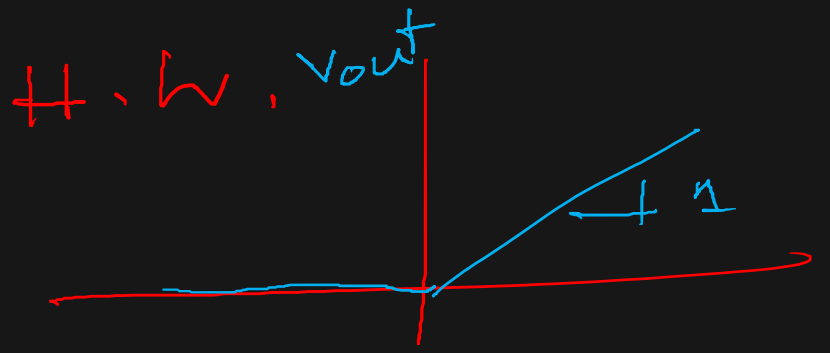

D4
D1
D2
D3
Vout
=
D2
D4
Vin
D3
D1
Vout

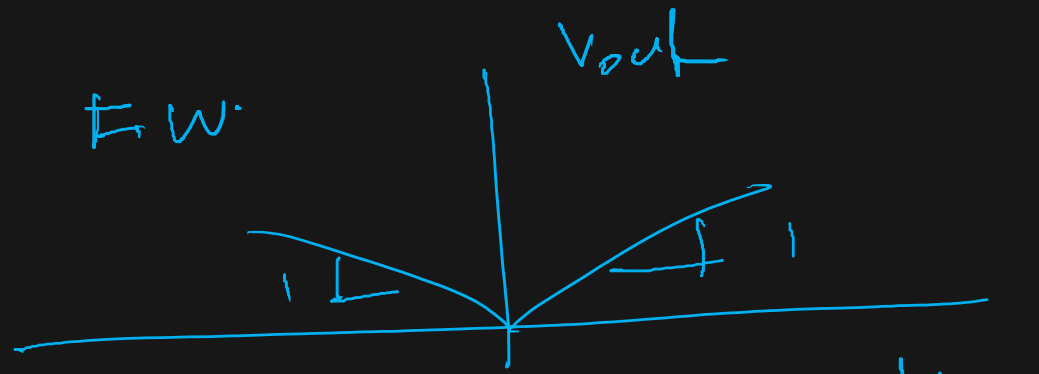
Transfer characteristics : ideal Diode



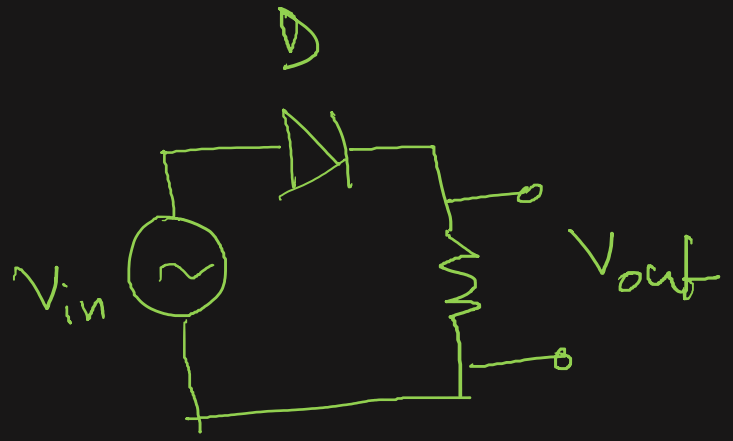






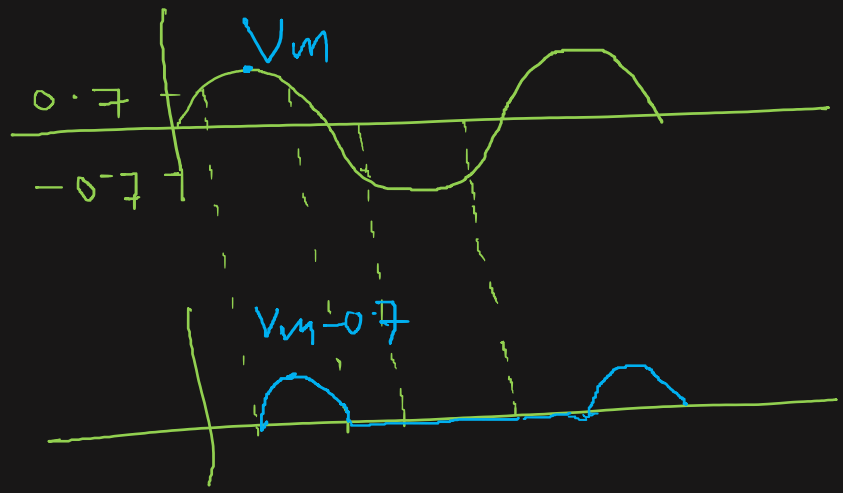


Half-wave Rectifier (Real Diode)

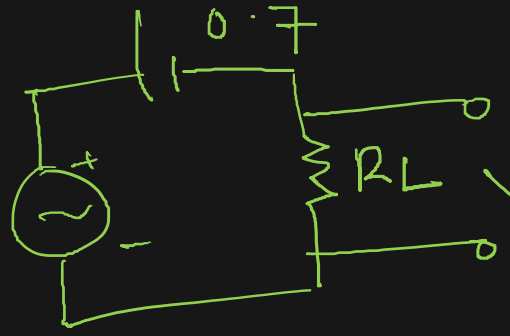


$< V_D$

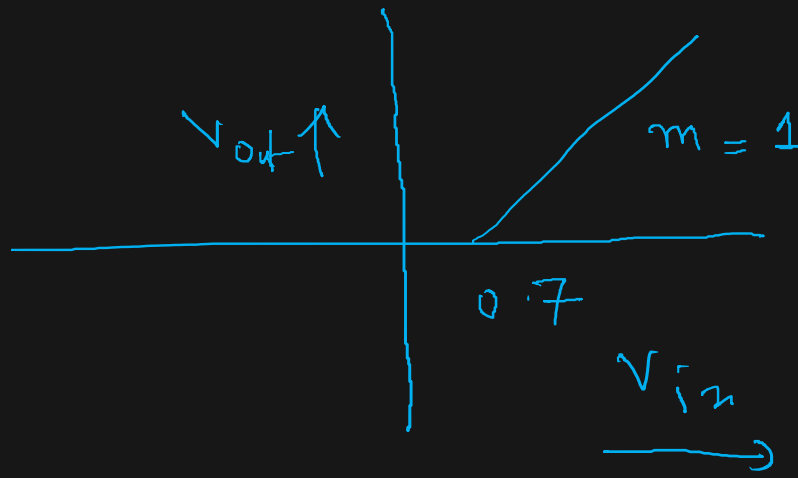
$V_{D_0} = 0.7V$



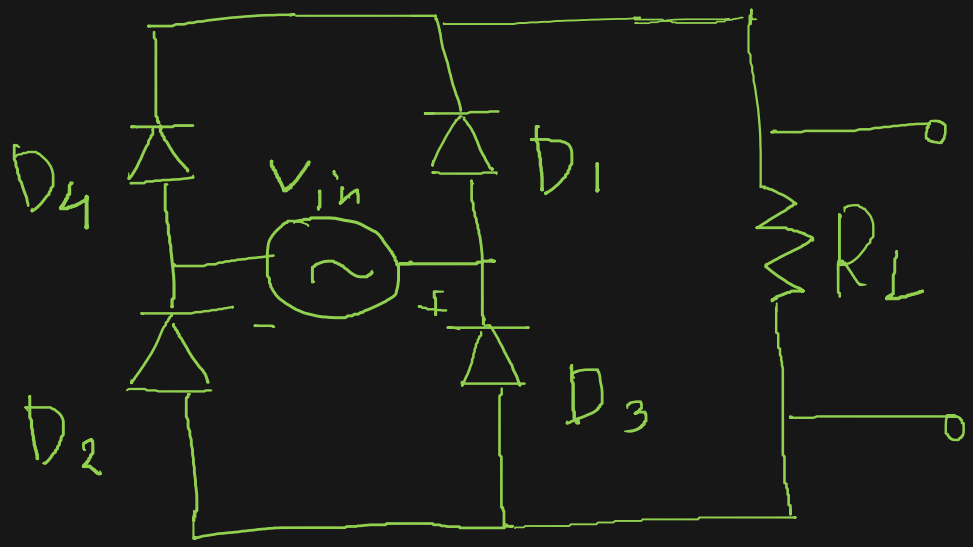
Positive Half cycle

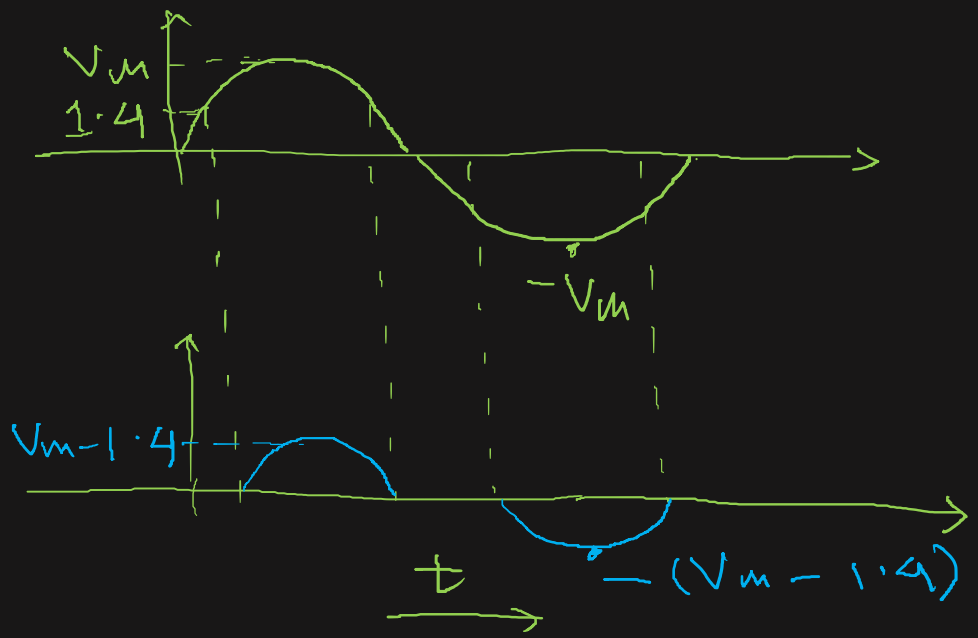
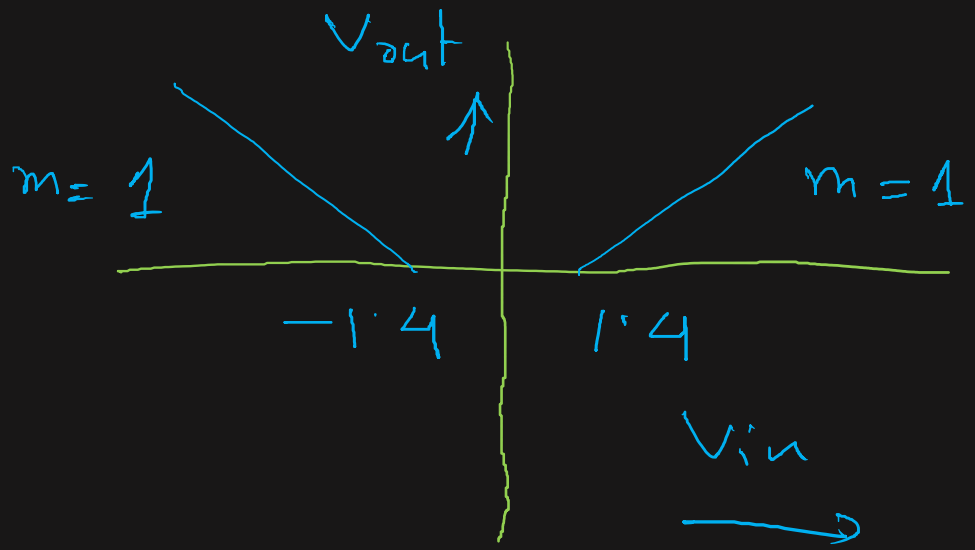


$V_{out} = V_{in} - 0.7V$



Fullwave Rectifier



$V_{out} = V_{in} - 0.7V - 0.7V$

$= V_{in} - 1.4V$