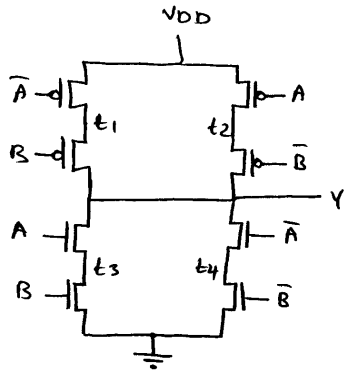
COE 360

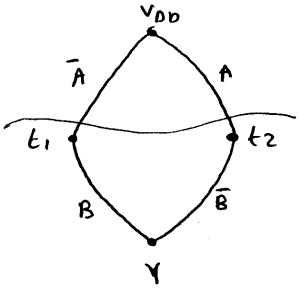
Dr. Aiman El-Maleh

HW#4

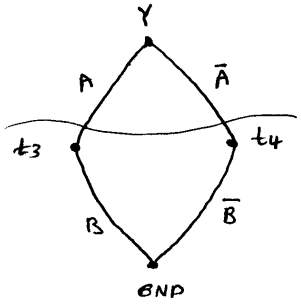
Q1 (i)



p-network

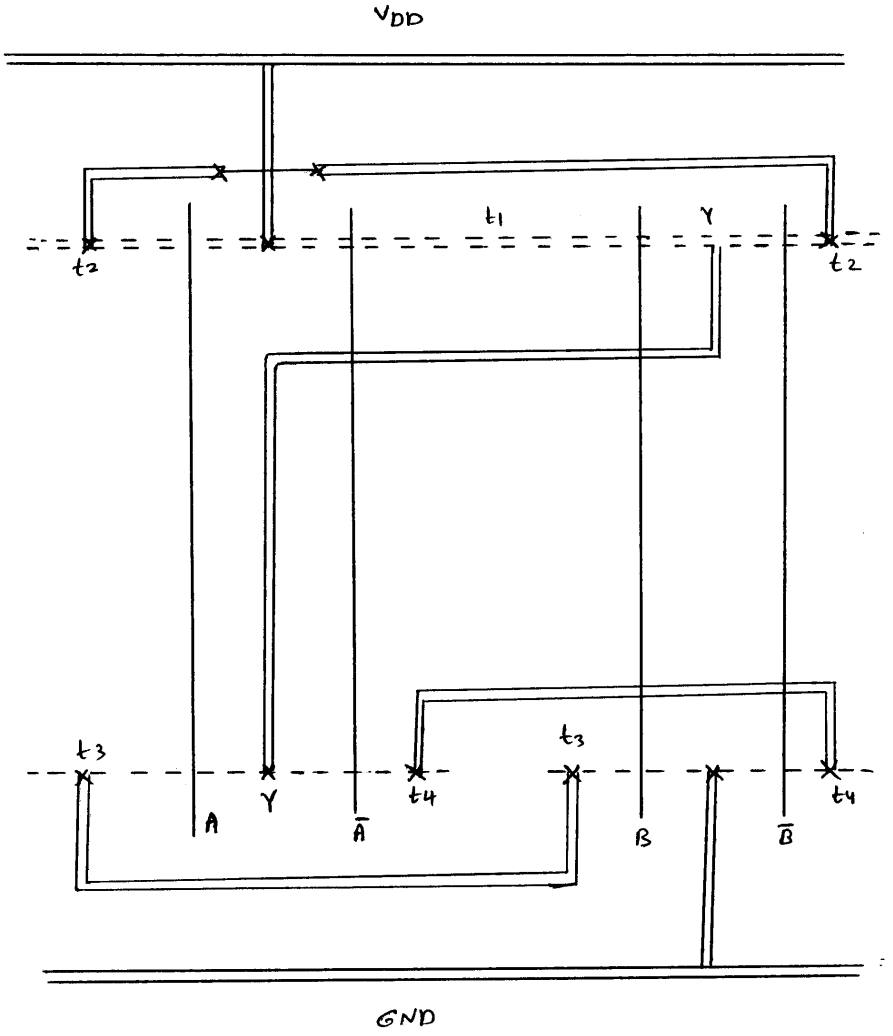


n-network

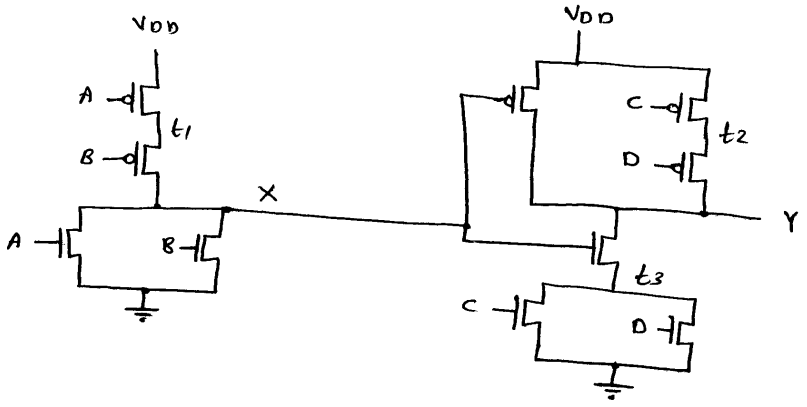


Since we can't find a common Euler path, we partition the graphs into two subgraphs such that a common Euler path is found. One way of partitioning the networks is shown above where we have the two Euler paths $\{A, \bar{A}\}$, $\{B, \bar{B}\}$

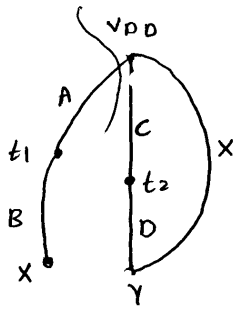
Stick Diagram Layout :



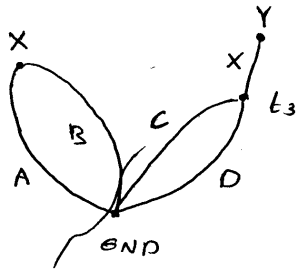
(ii)



p-network

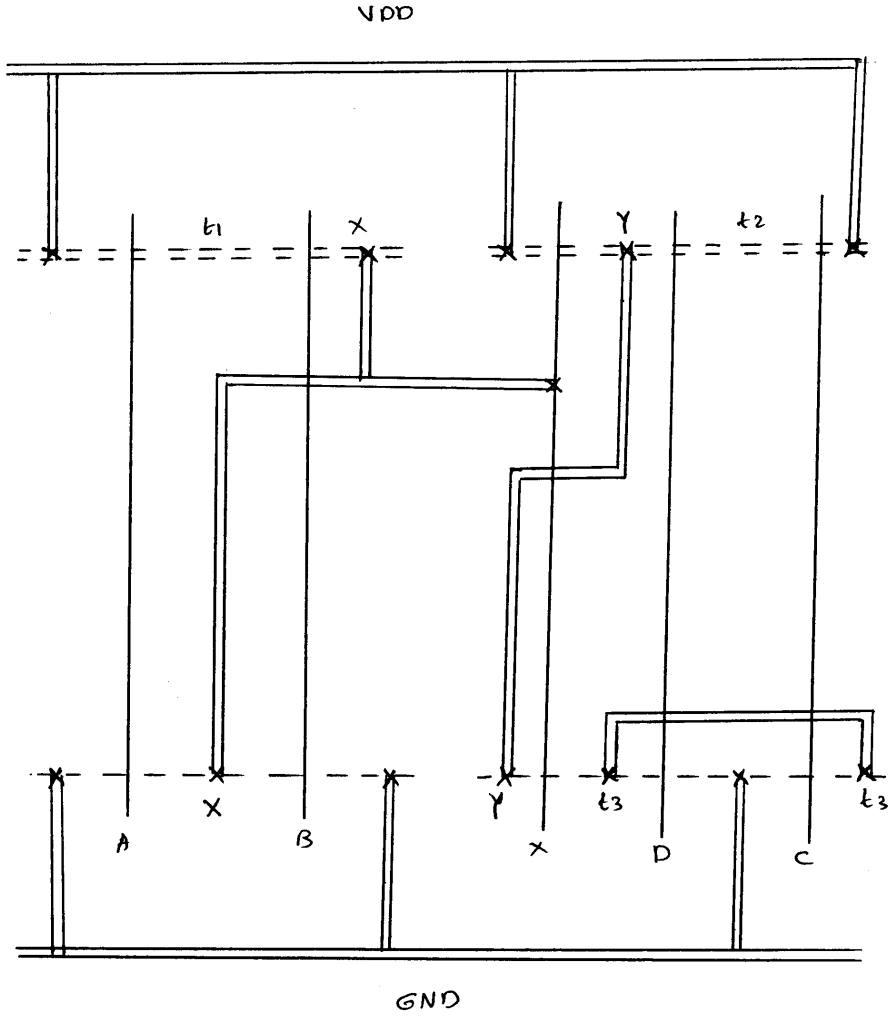


n-network



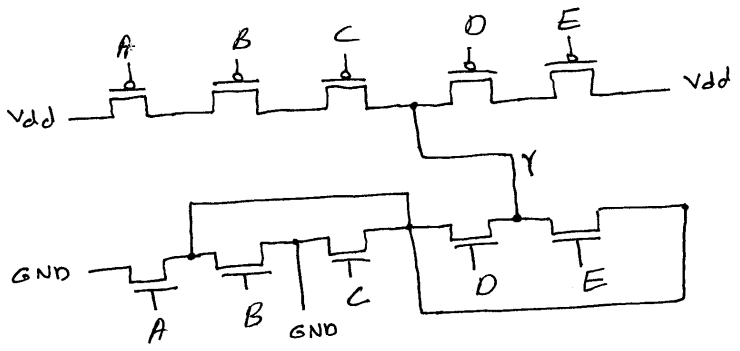
we can't find a common Euler path, so we partition the graphs into two subgraphs as shown above. Note that there several choices possible. Then, we have the two Euler paths $\{A, B\}$ and $\{X, D, C\}$

Stick Diagram Layout :

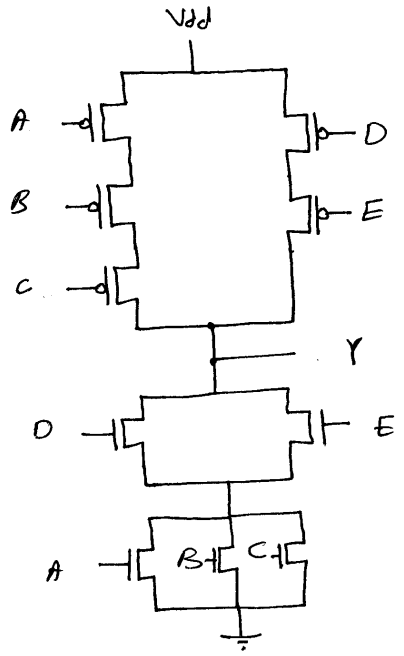


Q_2

(i)



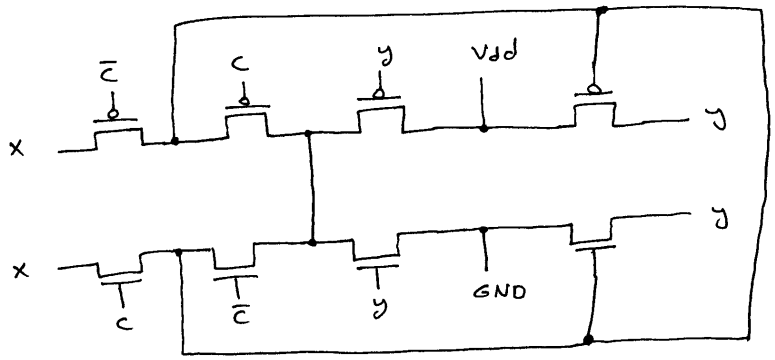
We can rearrange this as follows:



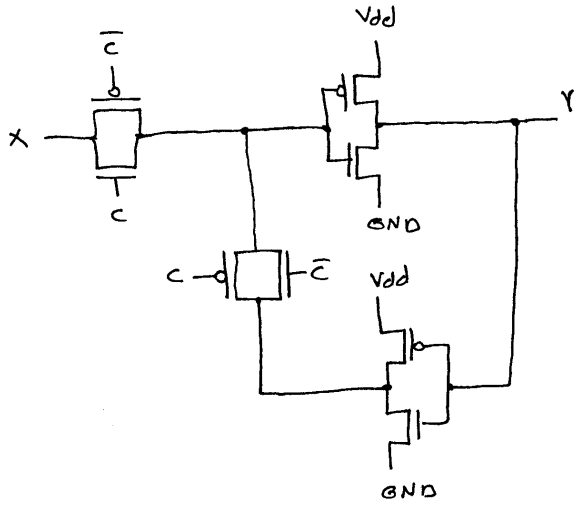
So, $Y = [(D+E)(A+B+C)]'$

or $Y = \bar{A}\bar{B}\bar{C} + \bar{D}\bar{E}$

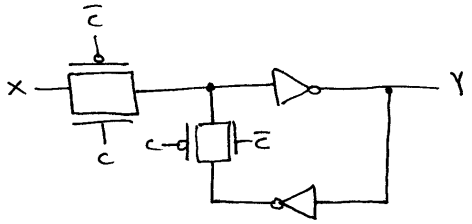
(ii)



We can rearrange this as follows:

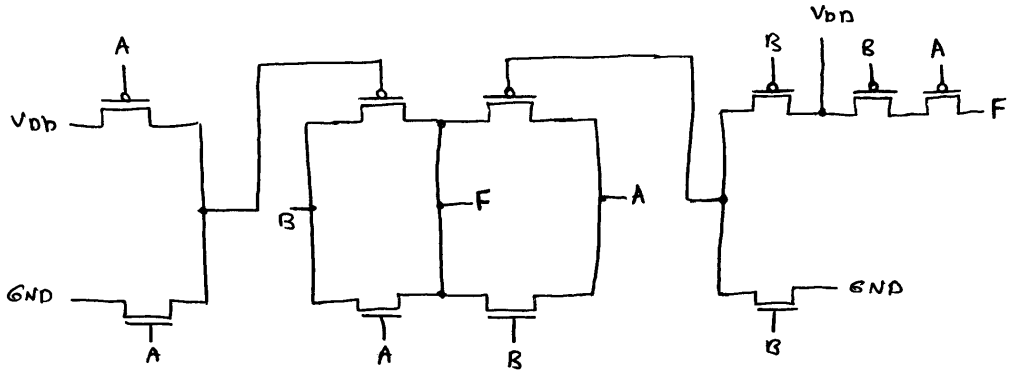


⇒

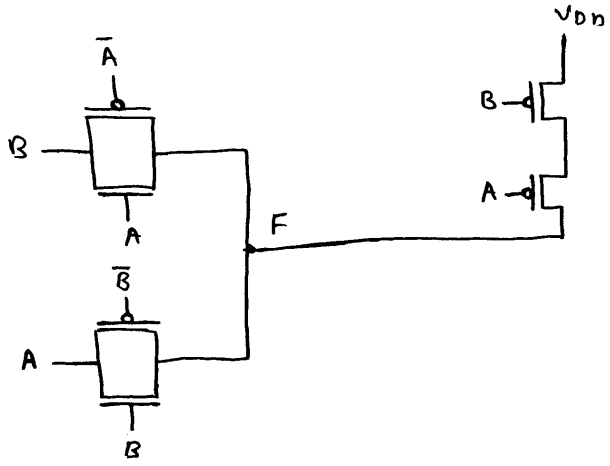


we can see that this implements a D-latch where x is the D input, and C the clock input. Y here is $\overline{Q}$.

Q3



We can rearrange this as follows;

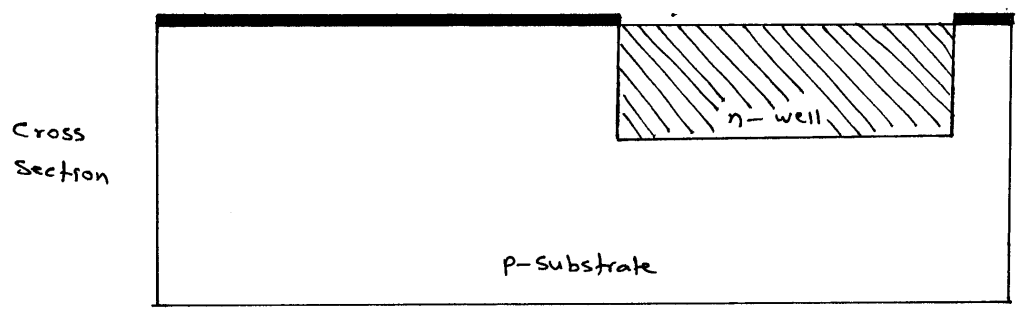


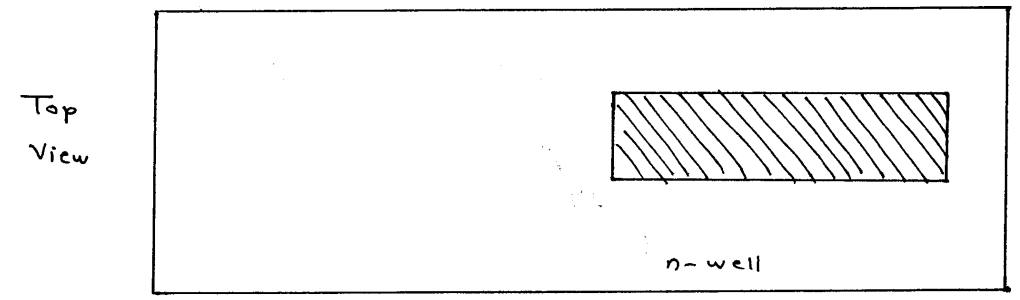
A	B	F
0	0	1
0	1	0
1	0	0
1	1	1

$F = \bar{A}\bar{B} + AB$

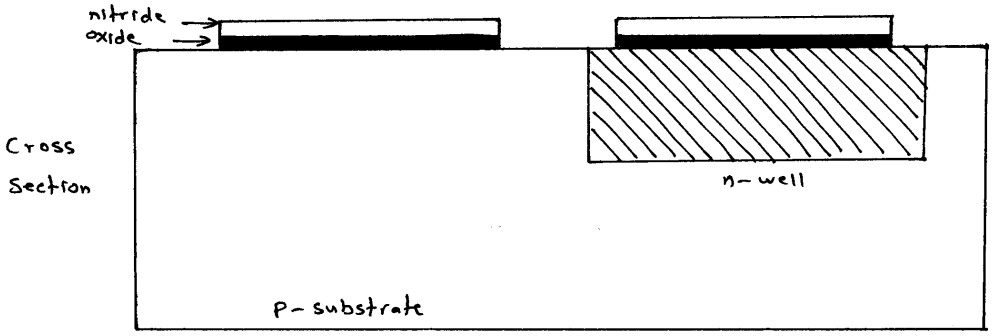
$= A \text{ XNOR } B$

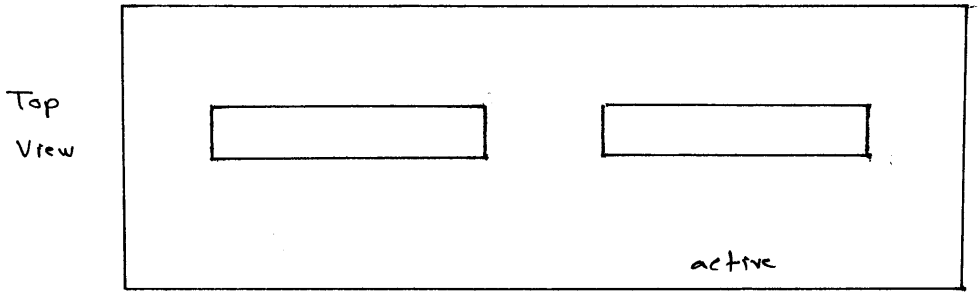
Q.4 (a) n- well mask



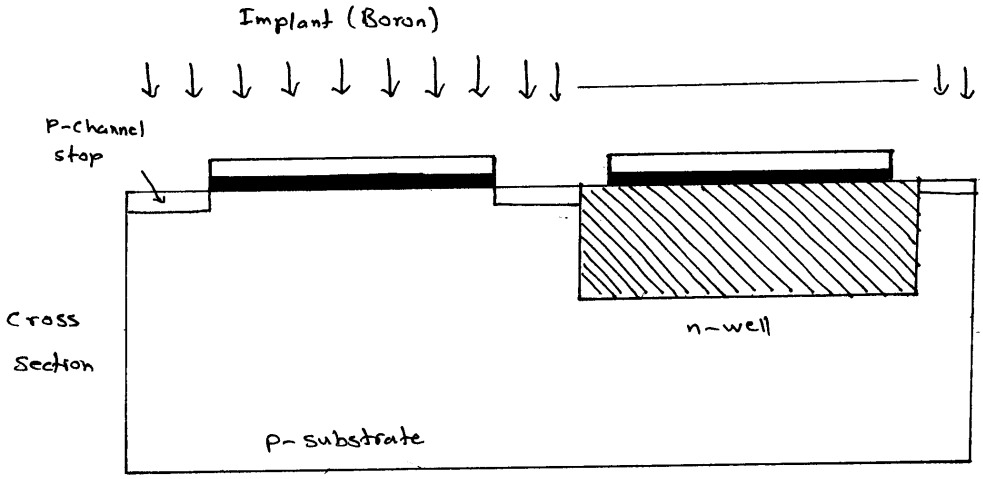


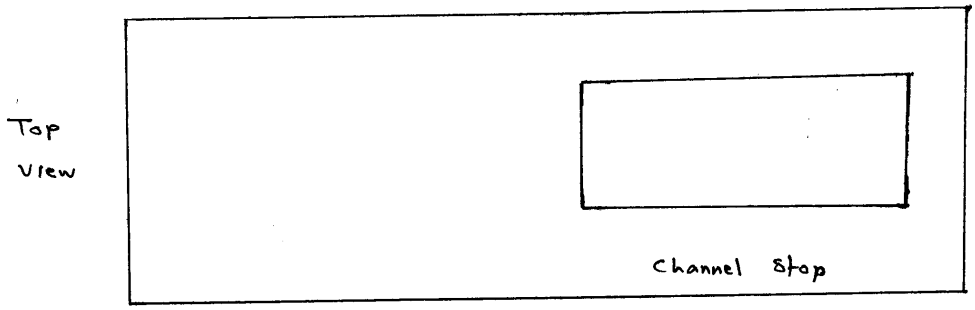
(b) Active mask



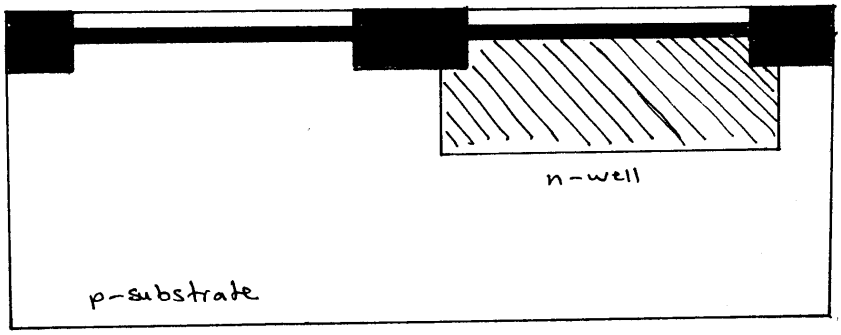


(c) Channel stop mask:

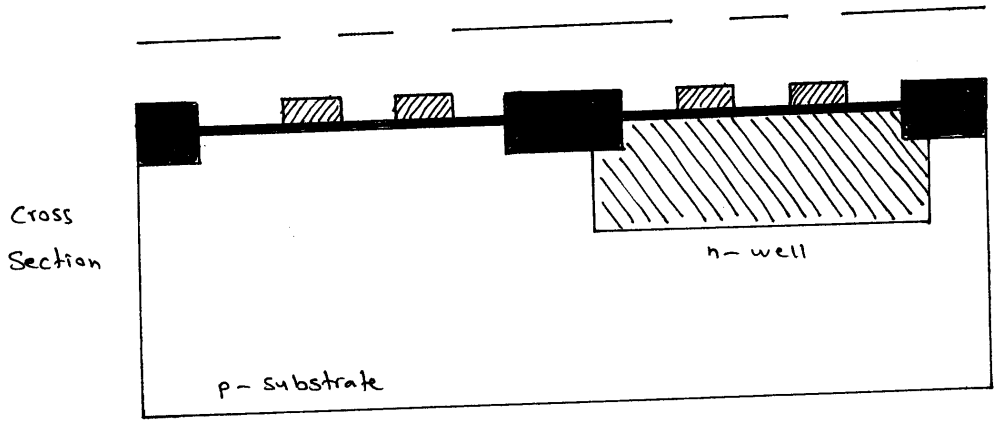


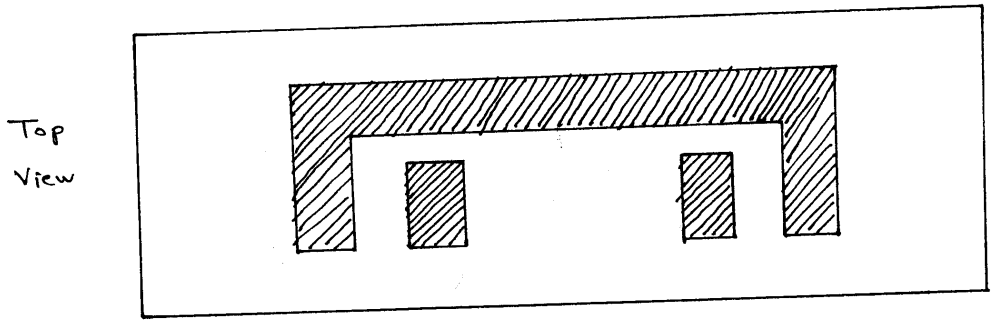


(d) Field Oxide Growth



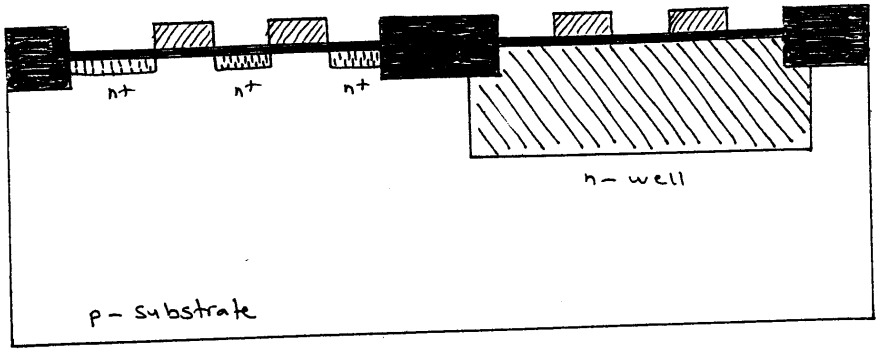
(e) Polysilicon mask



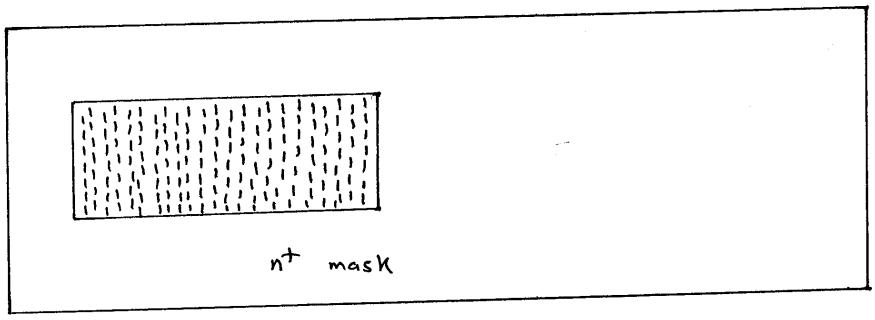


(f) n^+ mask

Cross Section

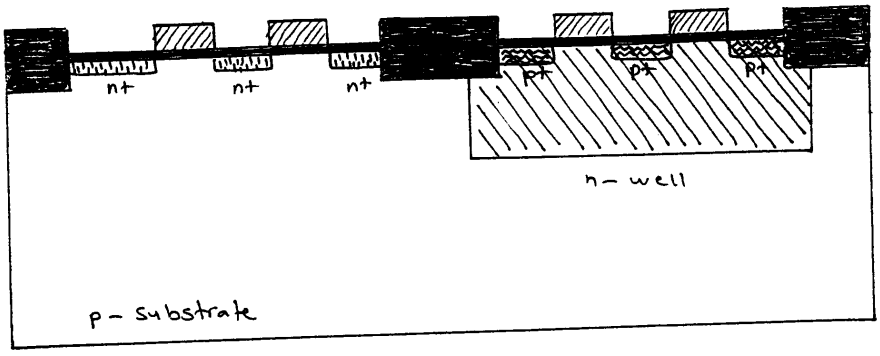


Top View

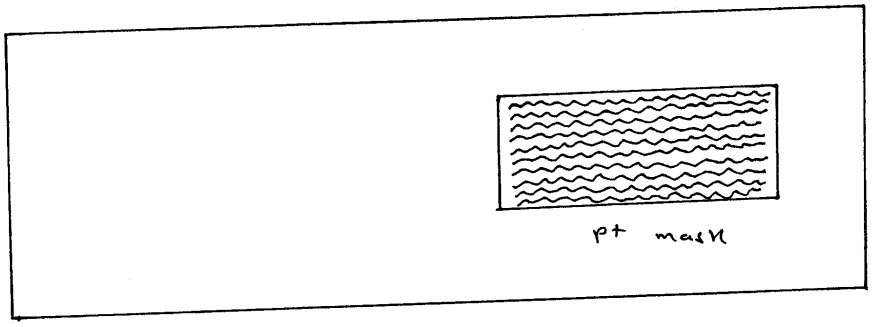


(9) p+ mask

Cross Section

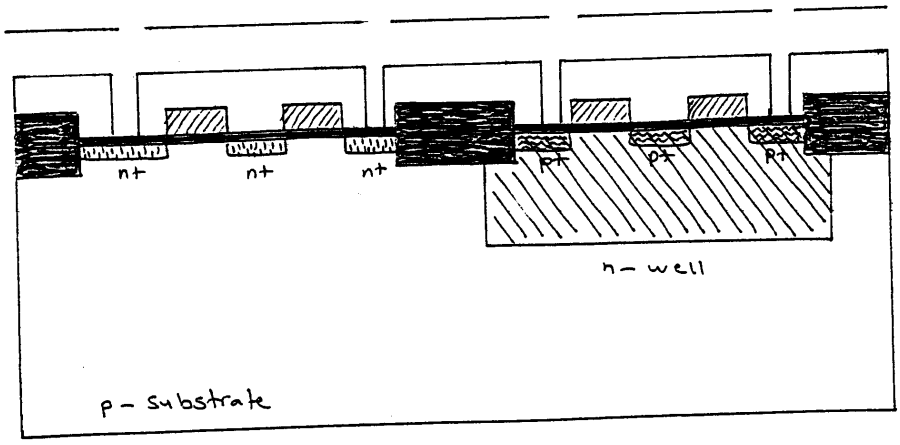


Top View

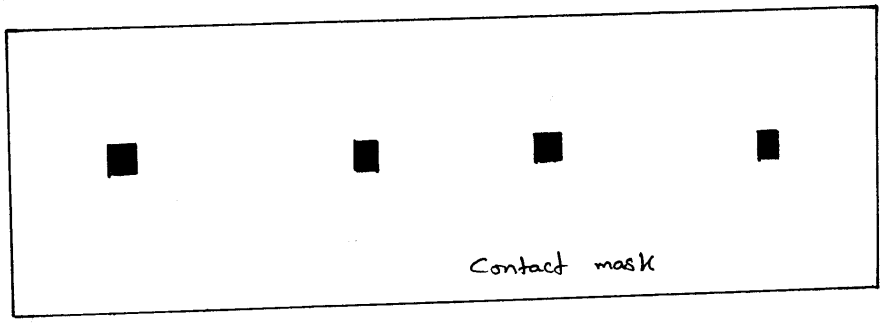


(h) Contact Mask

Cross Section



Top View



(i) Metal Mask

Cross Section