Truth Table

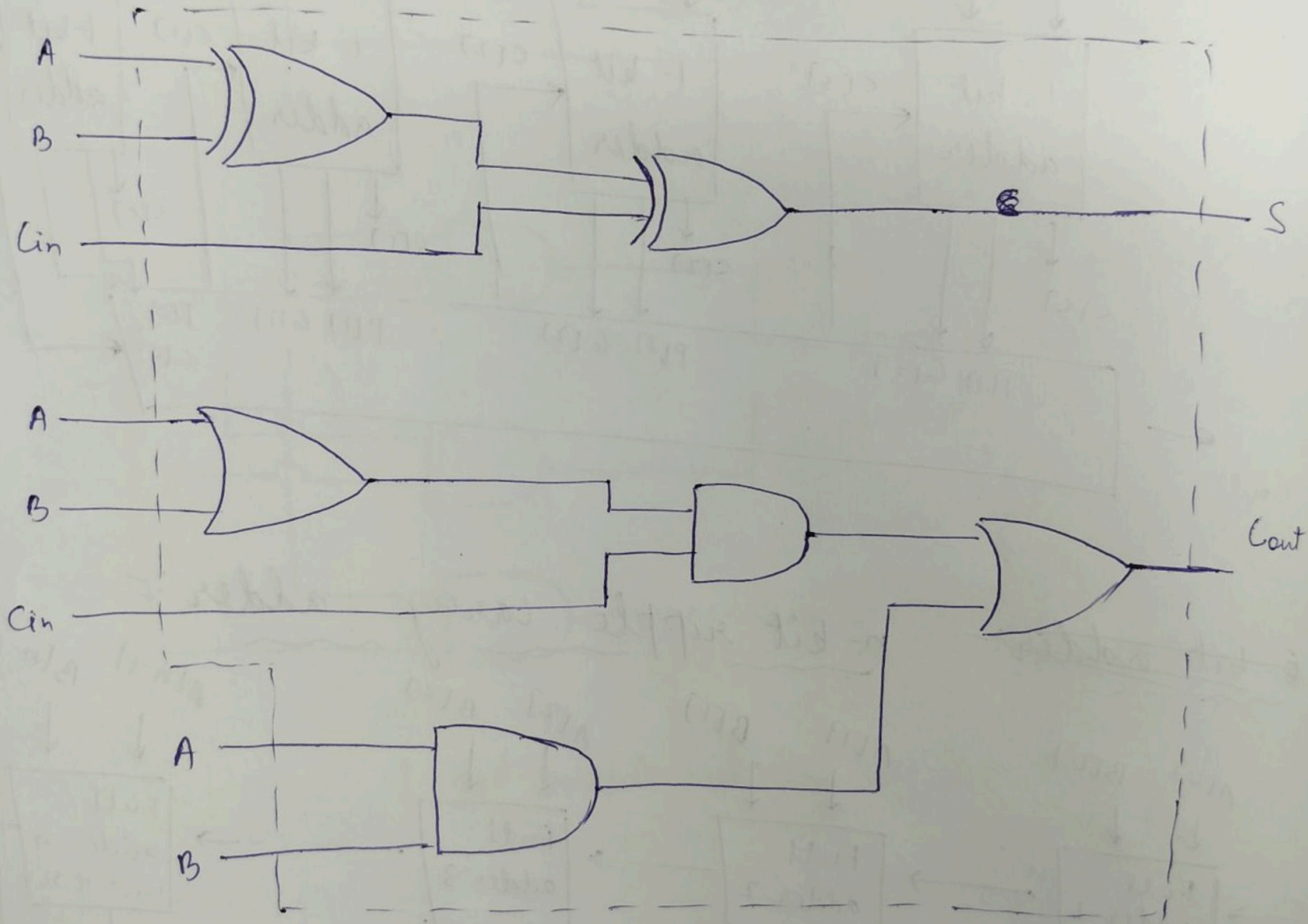
Half - Adder :-

A	B	Sum	Carry
0	0	0	0
0	1	1	0
1	1	0	1
1	0	1	0

Full - Adder

Inputs			Outputs	
A	B	C_{in}	Sum	Carry
0	0	0	0	0
0	0	1	1	0
1	0	0	1	0
1	0	1	0	1
0	1	0	1	0
0	1	1	0	1
1	1	0	0	1
1	1	1	1	1

1- bit adder:-



Circuit Diagram

4-bit adder

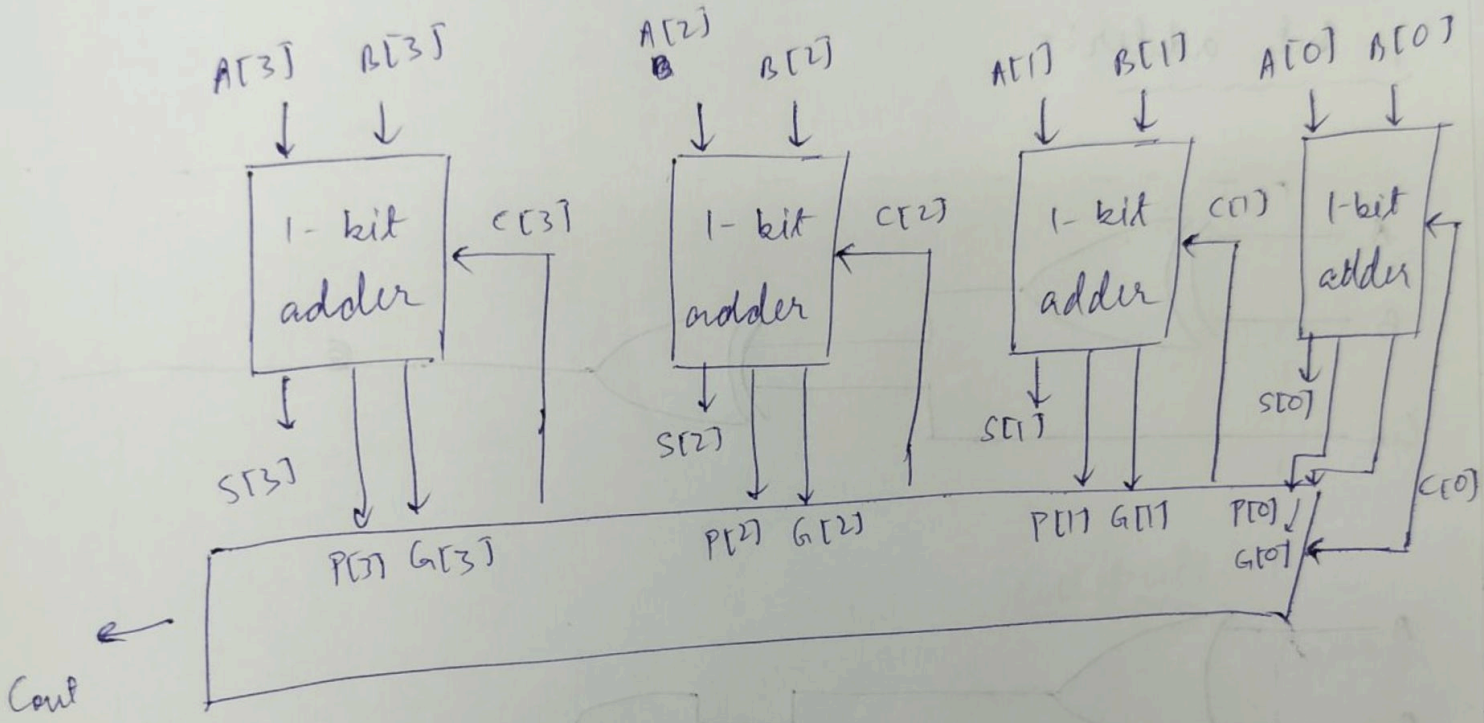
$G_i = A_i \,\&\, B_i$

$P_i = A_i \mid B_i$

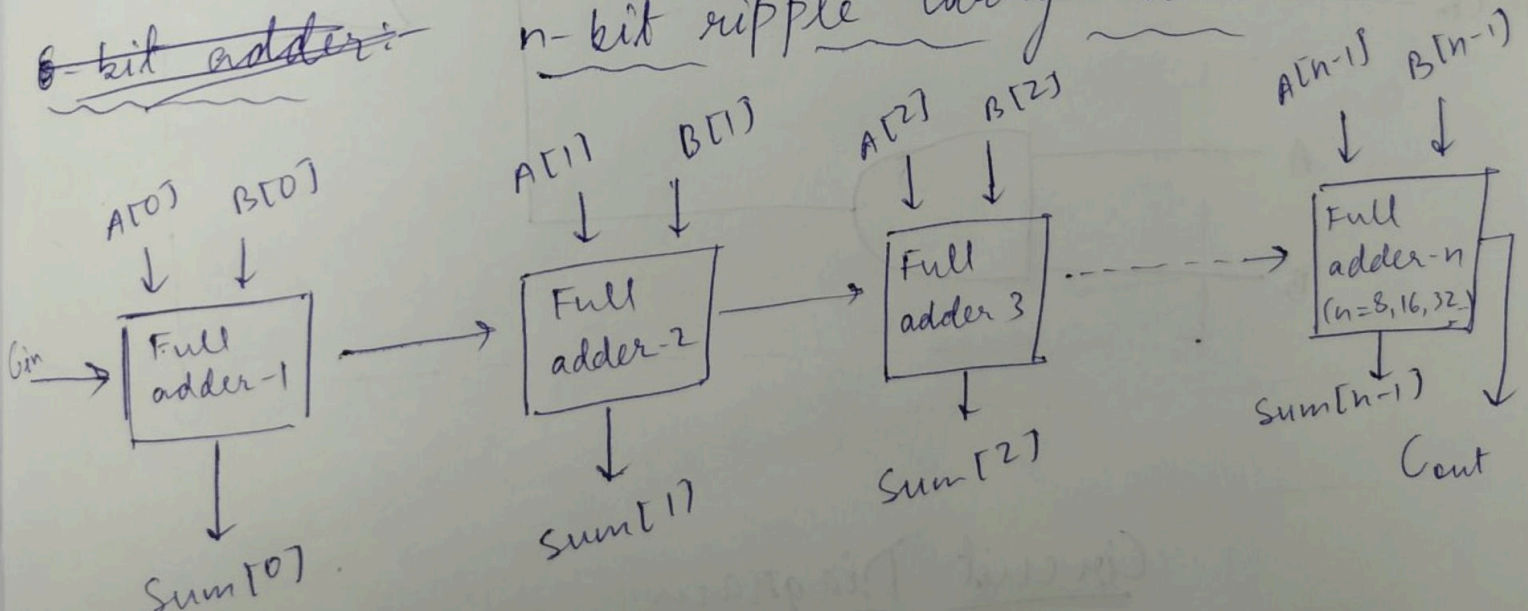
$C[0] = C_{in}$

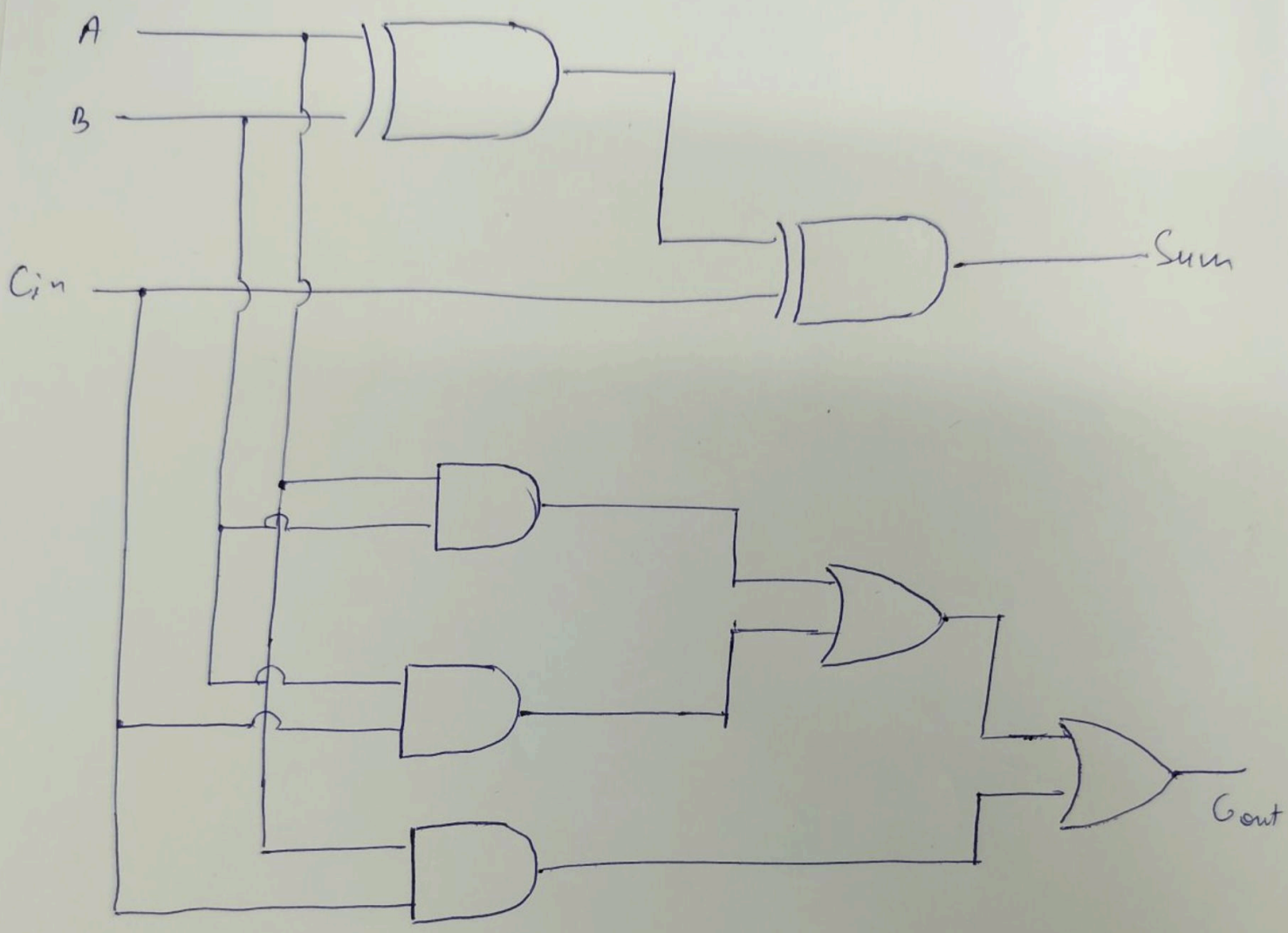
$0 \le i < 4 : \quad C[i] = G[i] \mid (P[i] \,\&\, C[i])$

$0 \le i < 4 : \quad Sum[i] = A[i] \wedge B[i] \wedge C[i]$



~~4-bit adder:~~ n-bit ripple carry adder :-





1-bit ripple carry adder.