Assignment 5

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Submitted To:
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Q1)

$A = 1,\ B = 0,\ C_{in} = 1$

$\Sigma = (A \oplus B) \oplus C$

$\Sigma = (1 \oplus 0) \oplus 1$

$\Sigma = (1) \oplus 1$

$\Sigma = 0$

$C_{out} = AB + (A \oplus B) C_{in}$

$C_{out} = (1)(0) + (1 \oplus 0)1$

$C_{out} = 0 + (1)(1)$

$C_{out} = 1$

Q2)

$\Sigma = 0, \quad C_{out} = 0.$

$A = 1 \quad B = ?$

For Σ and C_{out} both to be zero, A & B must be 0.

$A = 0$

$B = 0$

$\Sigma = A \oplus B$

$Ans = 0 = 0 \oplus 0$

$C_{out} = AB$

$C_{out} = 0.0.$

Q3)

A=1, B=1, Cin=1

$\Sigma = (A \oplus B) \oplus C$

$\Sigma = (1 \oplus 1) \oplus 1$

$\Sigma = (0) \oplus 1$

$\Sigma = 1.$

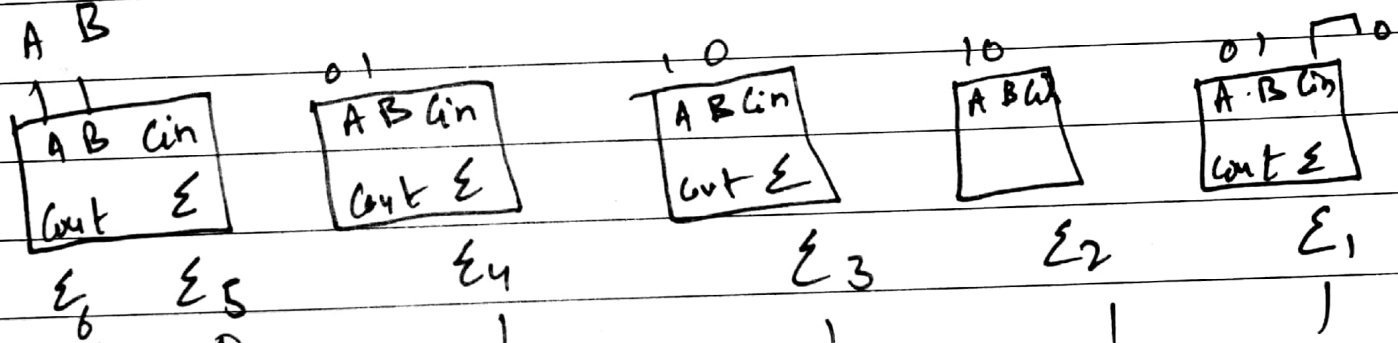
$Cout = AB + (A \oplus B) C$

$Cout = 1.1 = (1 \oplus 1) 1$

$Cout = 1 + (0) 1$

$Cout = 1$

Q4)



A 1 0 1 1 0

+B 1 1 0 0 1

1 0 1 1 1 1

Q5)

When the Add/subt is High, the input bits of B will be complemented, and resulting Σ will be subtraction of inputs bits.

(b) When the Add/subt is low, the inputs bits of A & B will not change & circuit will work as parallel adder of the inputs bits.

Q6)

Add/subs = 1, A = 1010, B = 1101.

for Σ_0: $A_0 = 0$, $B = 1 \oplus 1$, $C_{in} = 1$

$\Sigma_0 = 0 + 0 + 1 = 1$, $C_{out} = 0$.

Σ_1: $A = 1$, $B = 1 \oplus 0$, $C_{in} = 0$.

$\Sigma_1 = 1 + 1 + 0 = 0$, $C_{out} = 1$

for

$\Sigma_2 = 0 + 0 + 1 = 1$, $C_{out} = 0$.

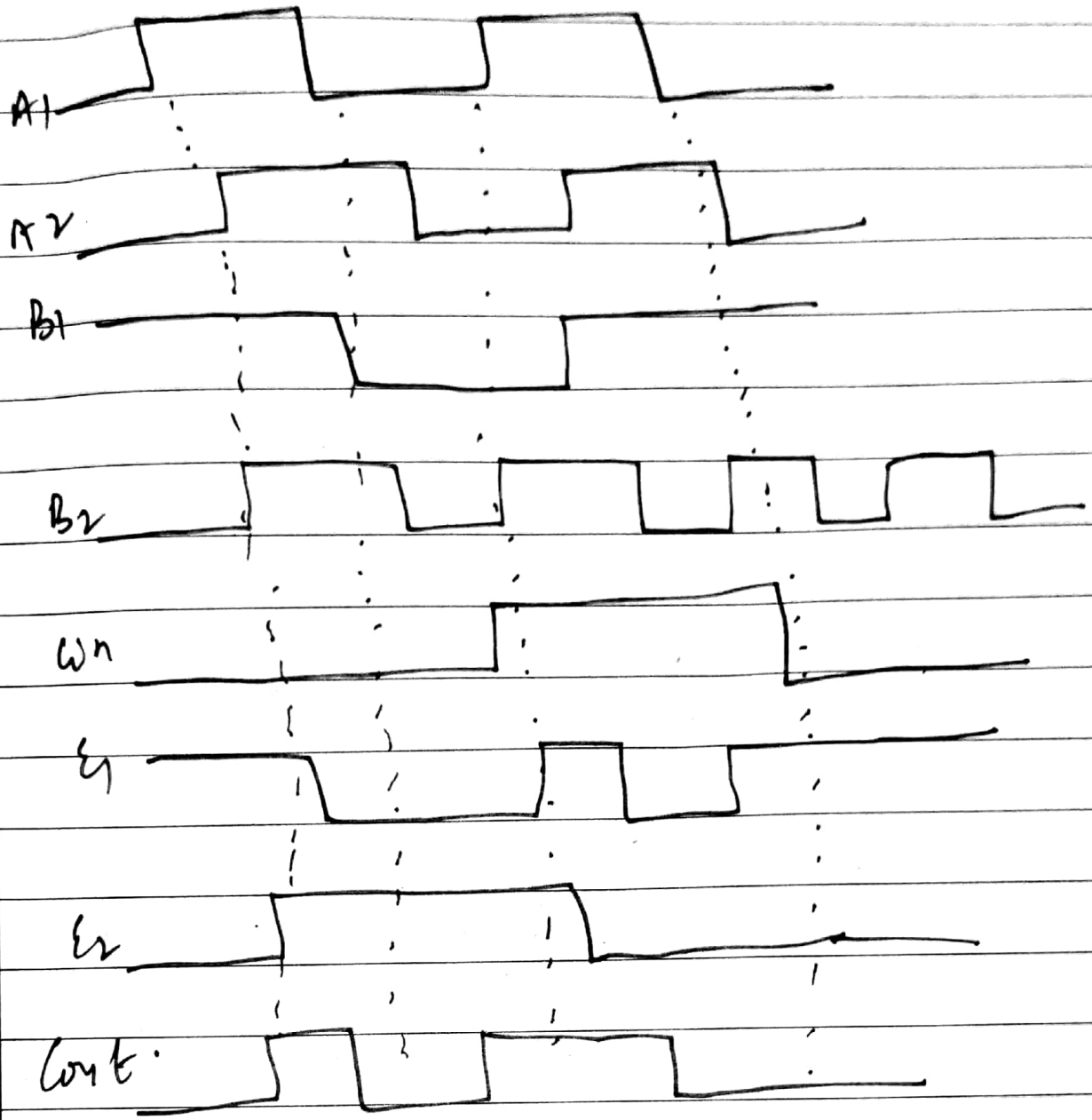
for

$\Sigma_3 = A_3 = 1$, $B_3 = 1 \oplus 1$, $C_{out} = 0$

$\Sigma_3 = 1 + 0 + 0 = 1$, $C_{out} = 0$.

$\Sigma = 1101$, $C_{out} = 0$.

07)



08)

$A = 1010$, $A_2 = 1100$, $A_3 = 0101$, $A_4 = 1101$

$B = 1001$, $B_2 = 1011$, $B_3 = 0000$, $B_4 = 001$.

A_4	A_3	A_2	A_1	+	B_4	B_3	B_2	B_1	=	ξ_5	ξ_4	ξ_3	ξ_2	ξ_1
1	0	0	1		0	0	1	1		0	1	1	1	0
1	1	1	0		0	0	0	0		0	1	1	1	0
0	0	0	1		0	0	1	0		0	0	0	1	1
1	1	0	0		0	1	1	1		0	1	1	1	1

$\xi_5 = 0001$

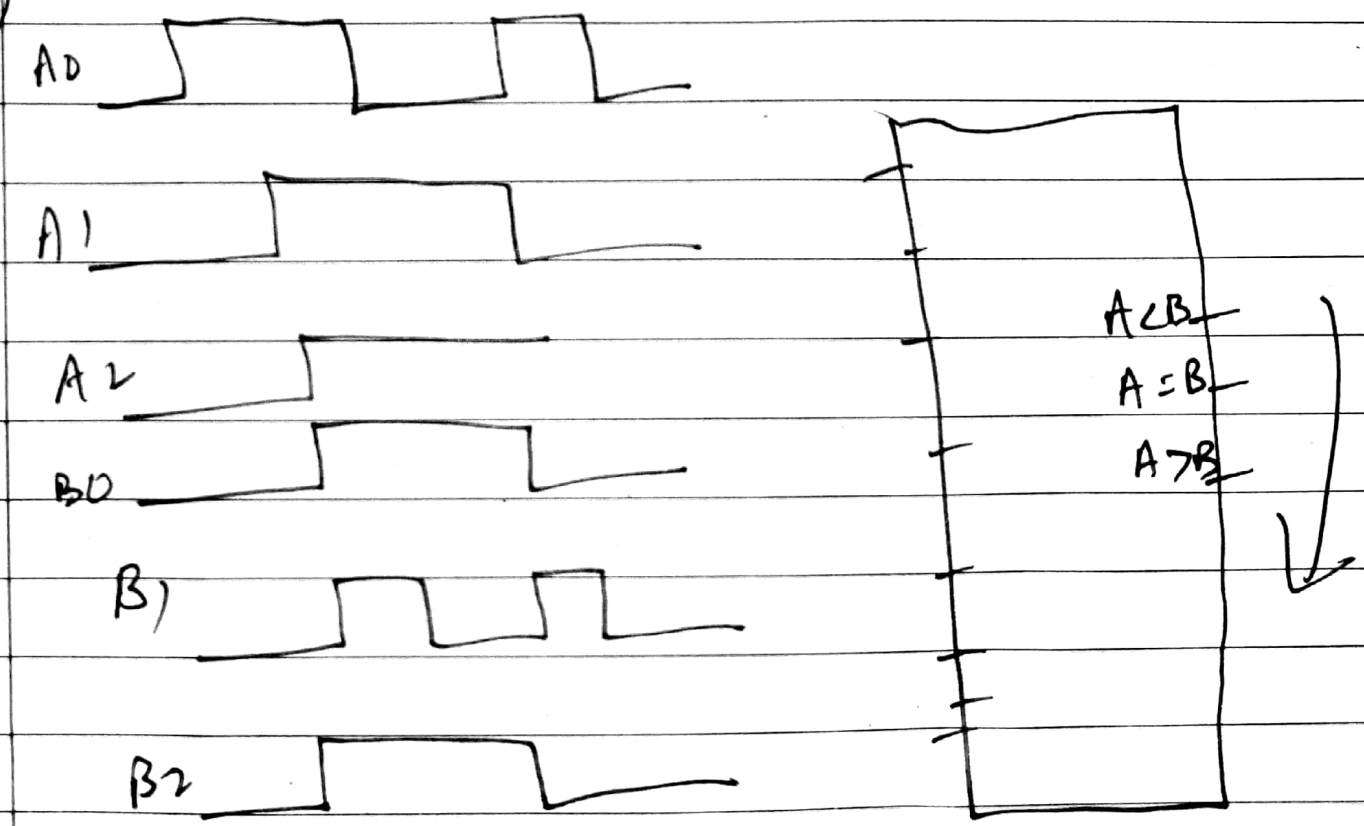
$\xi_4 = 1100$

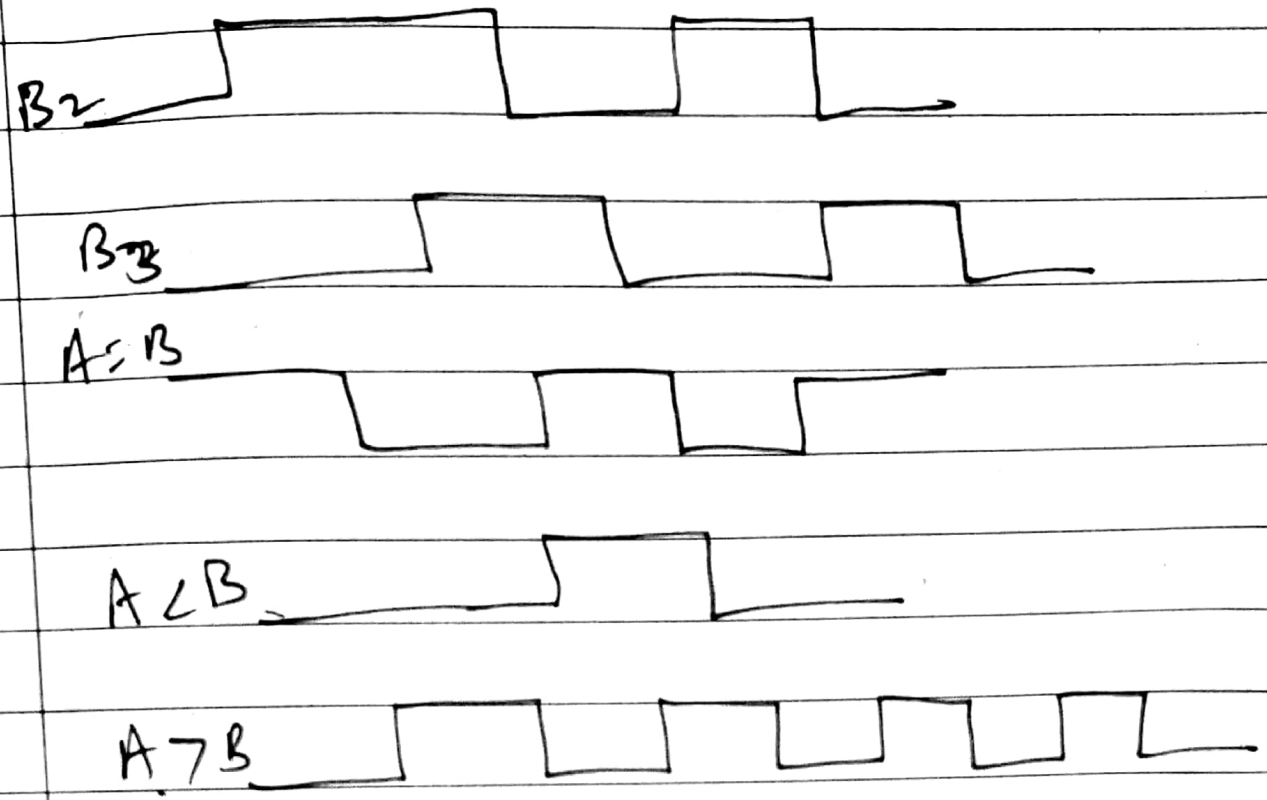
$\xi_3 = 1101$

$\xi_2 = 1111$

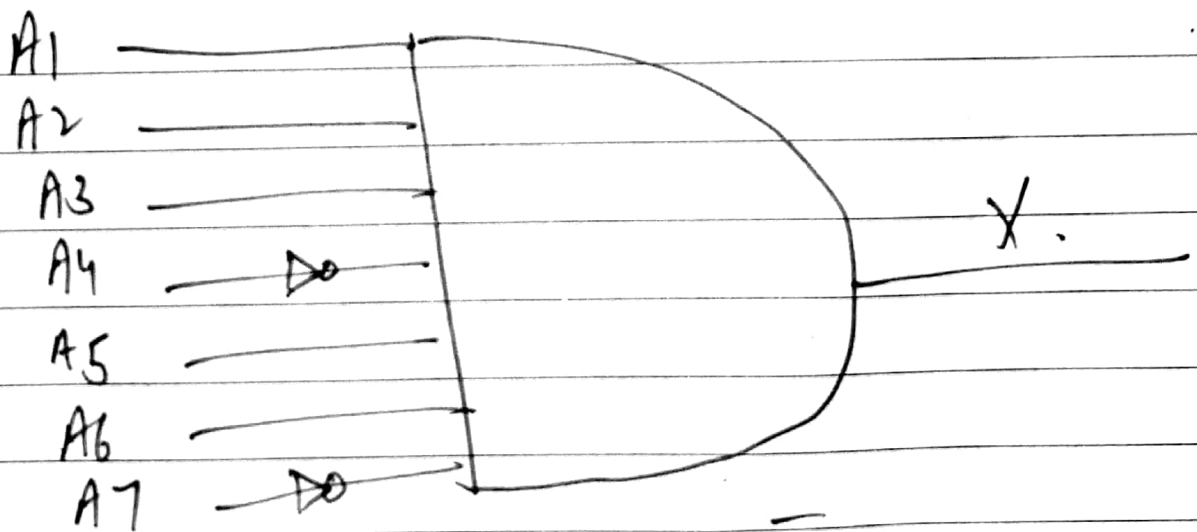
$\xi_1 = 0011.$

(b)



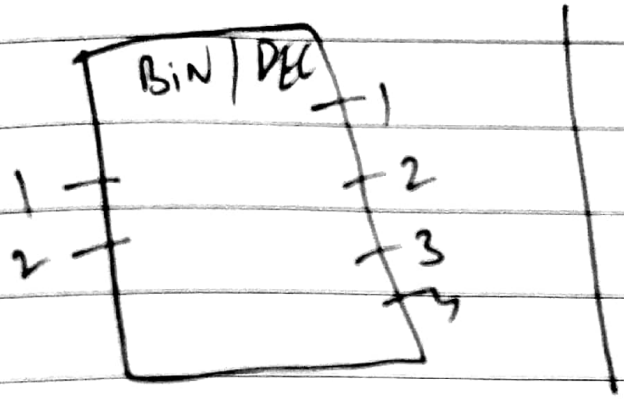


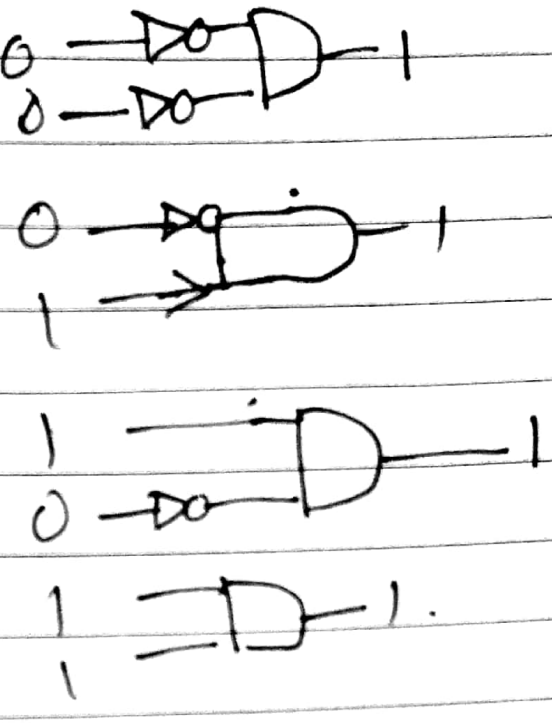
(Q11)



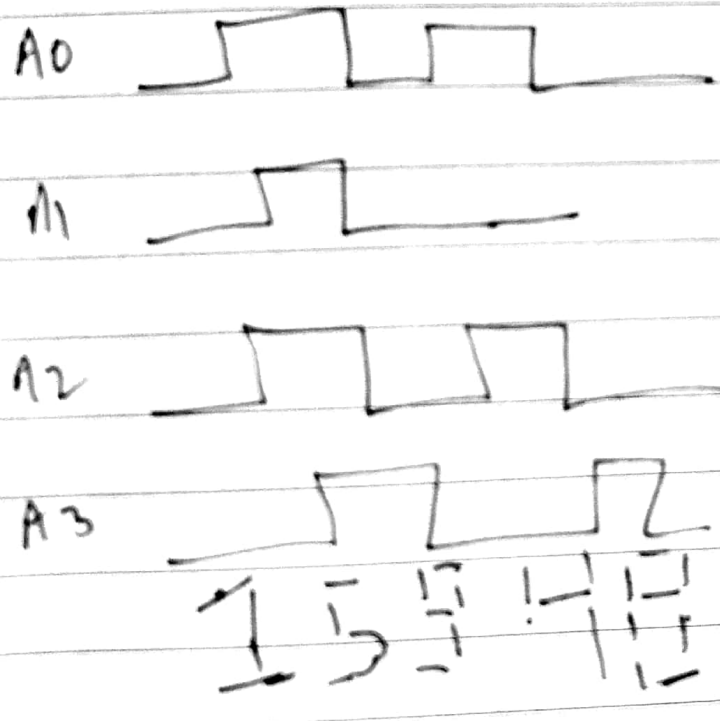
$X = \bar{A}_7 A_6 A_5 A_4 A_3 A_2 A_1.$

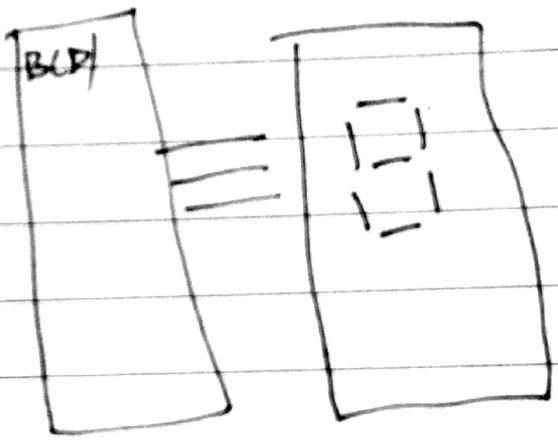
Q12



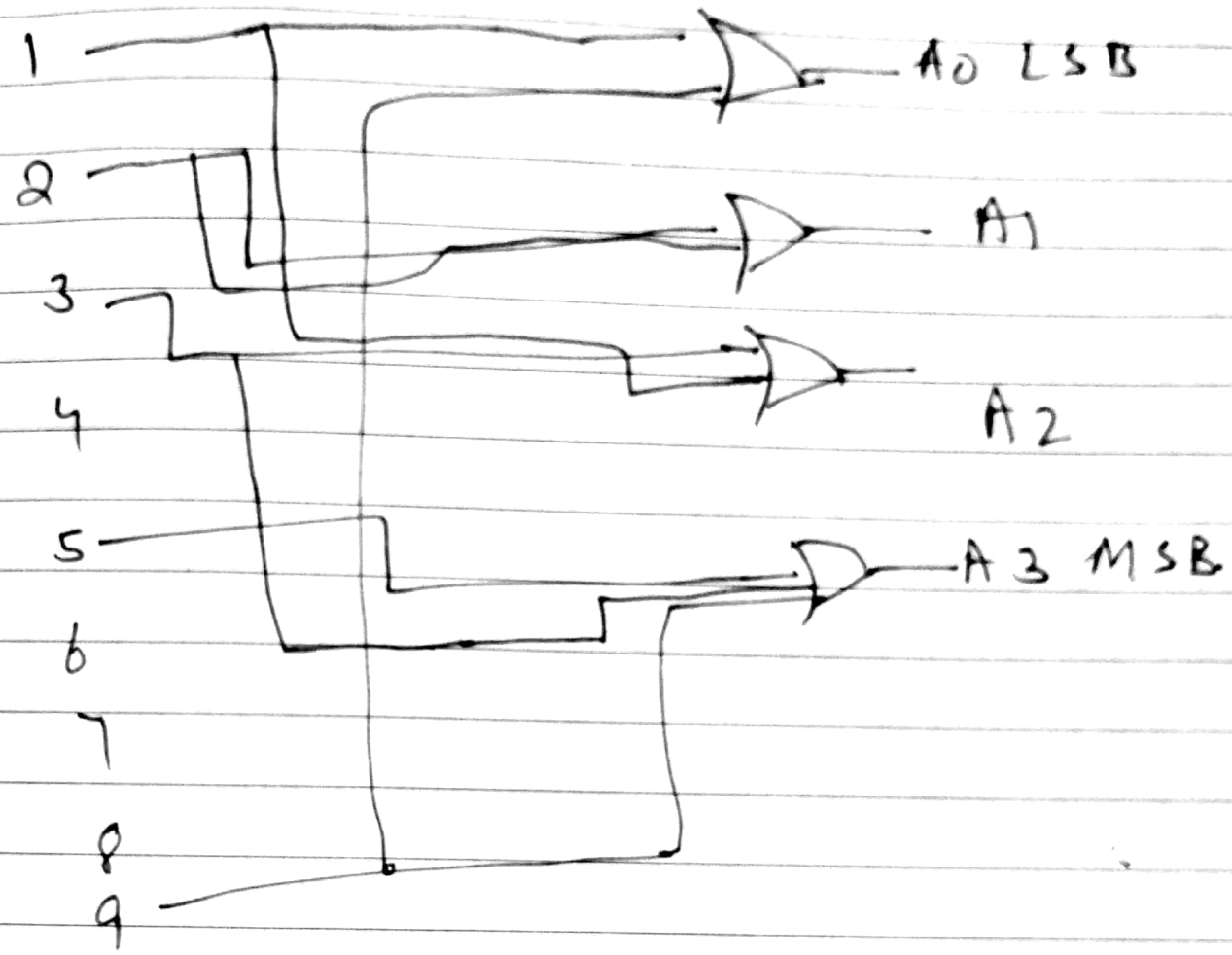


Q13).

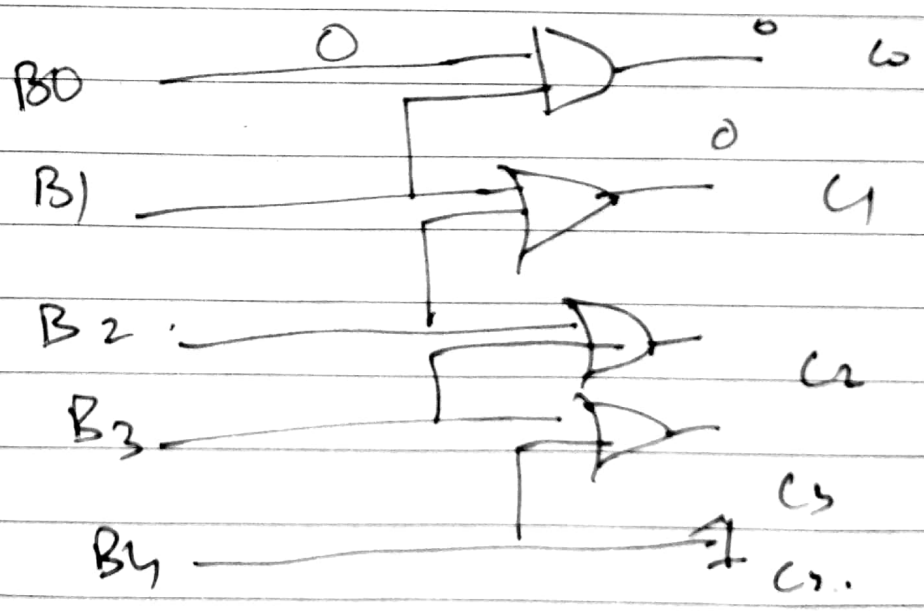




Q14)

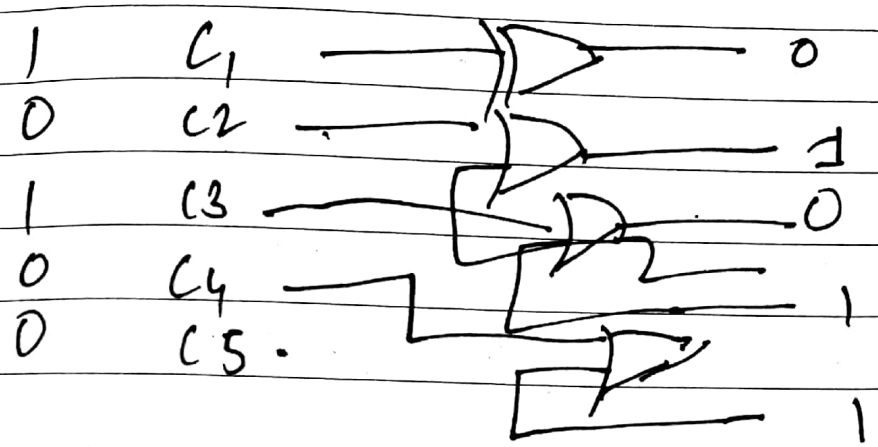


Q15).



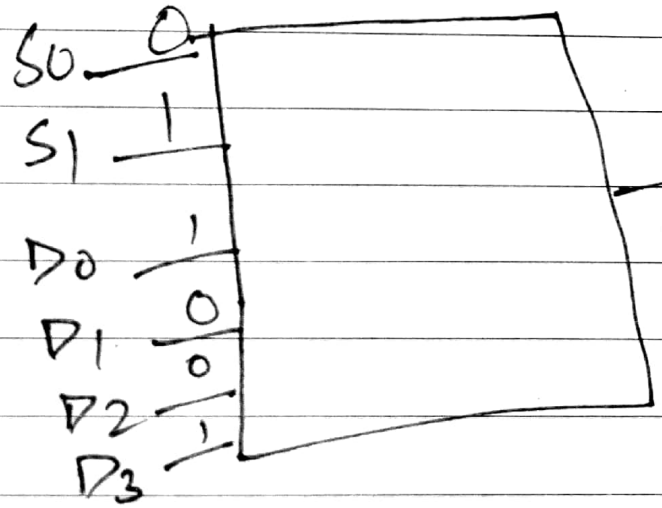
10100 = 11000

06).



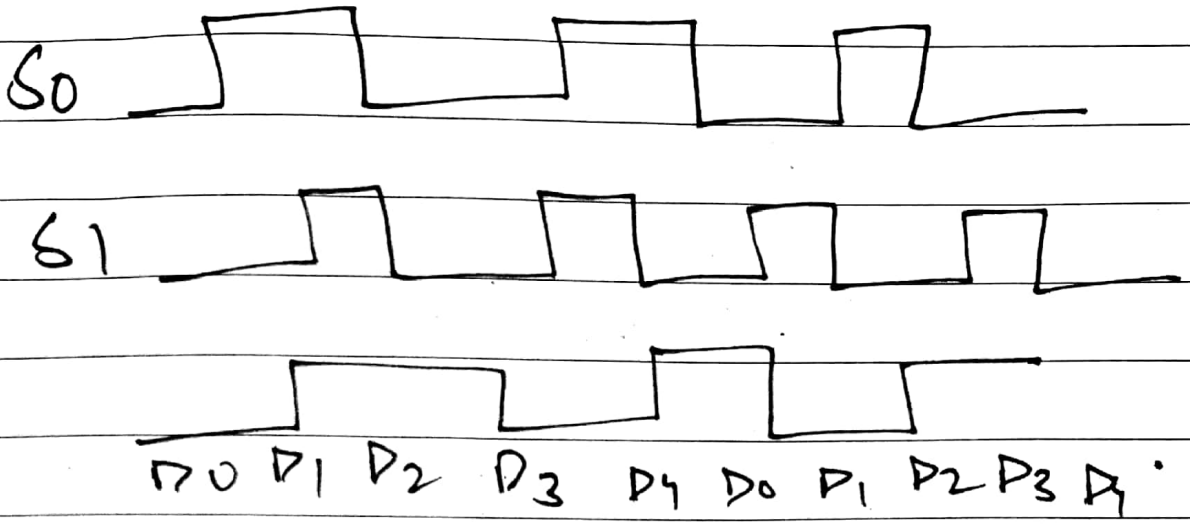
10111 = 11010.

07).

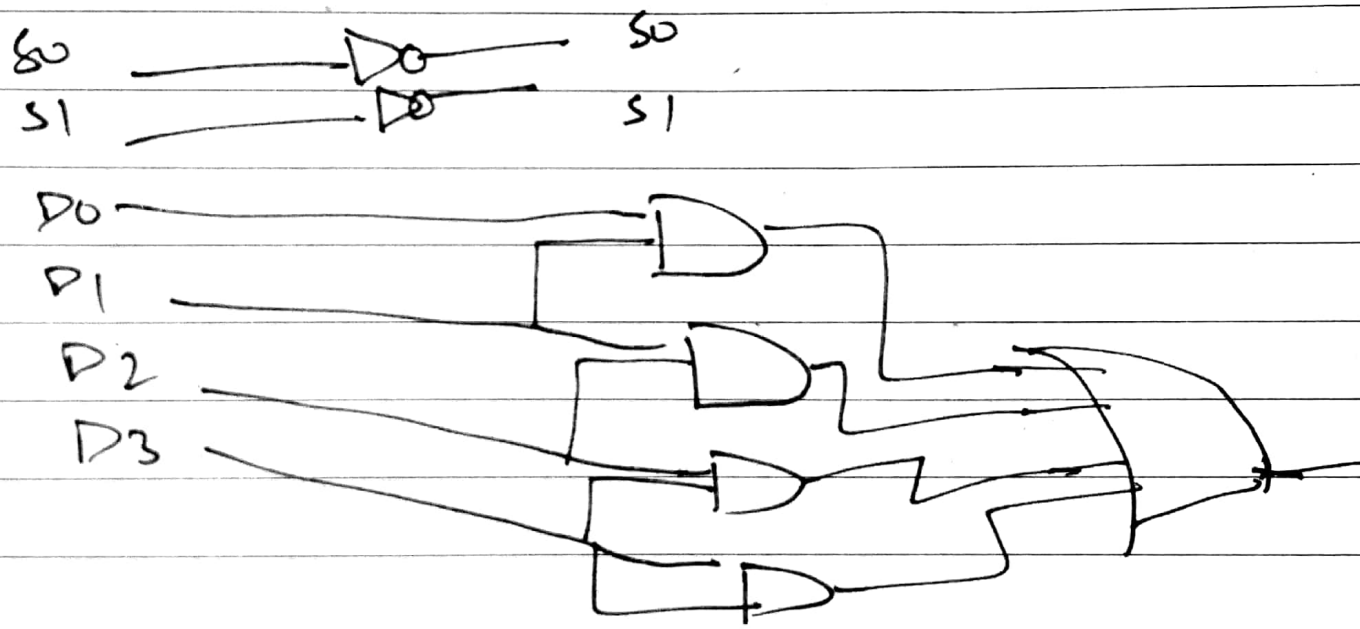


S0 S1 = 01, = D.

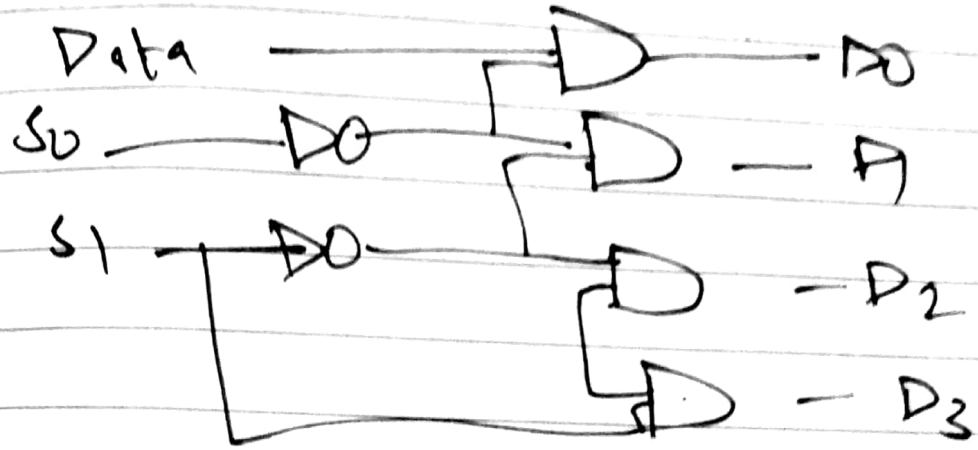
(18)



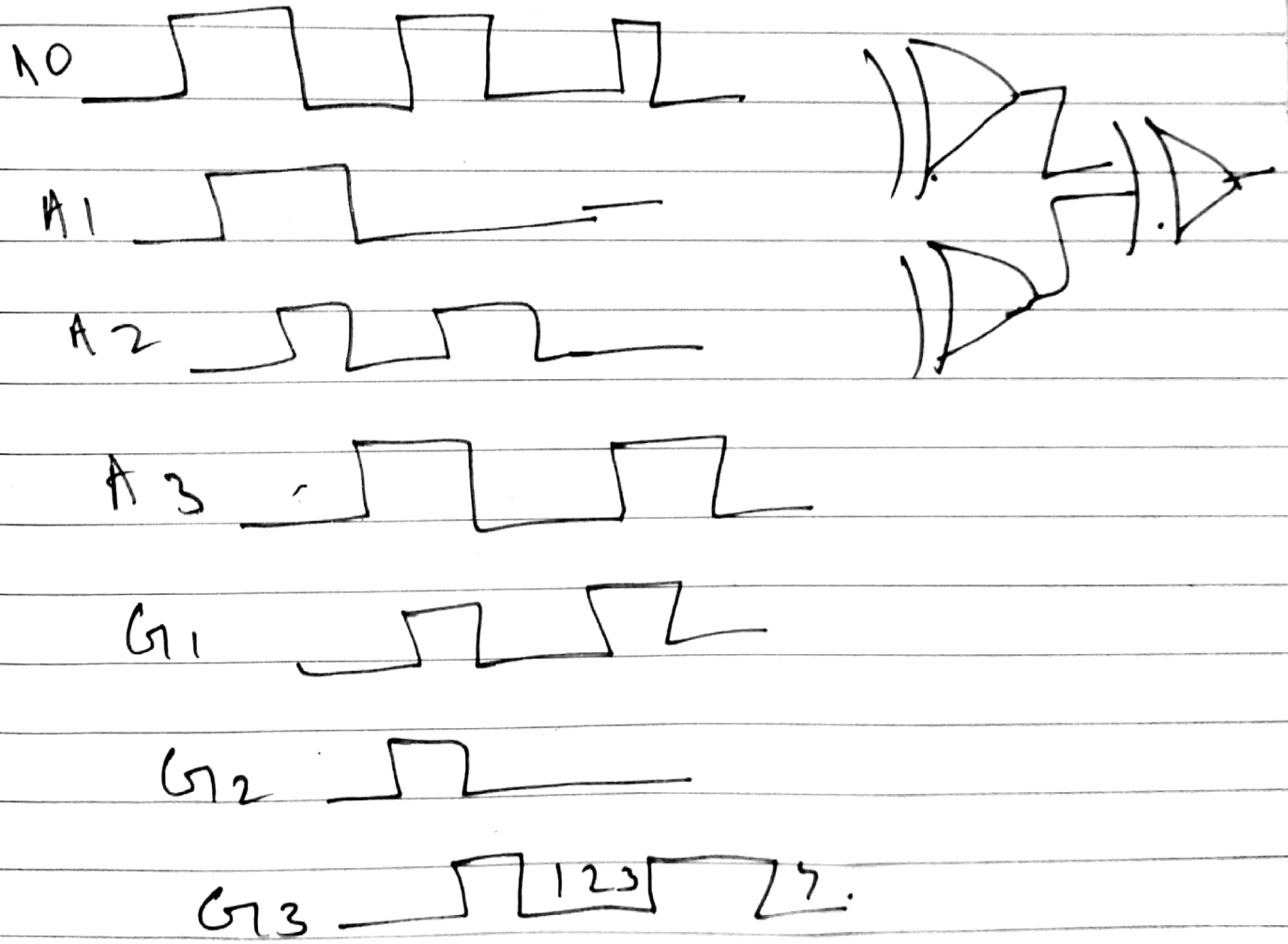
(19)



(20)

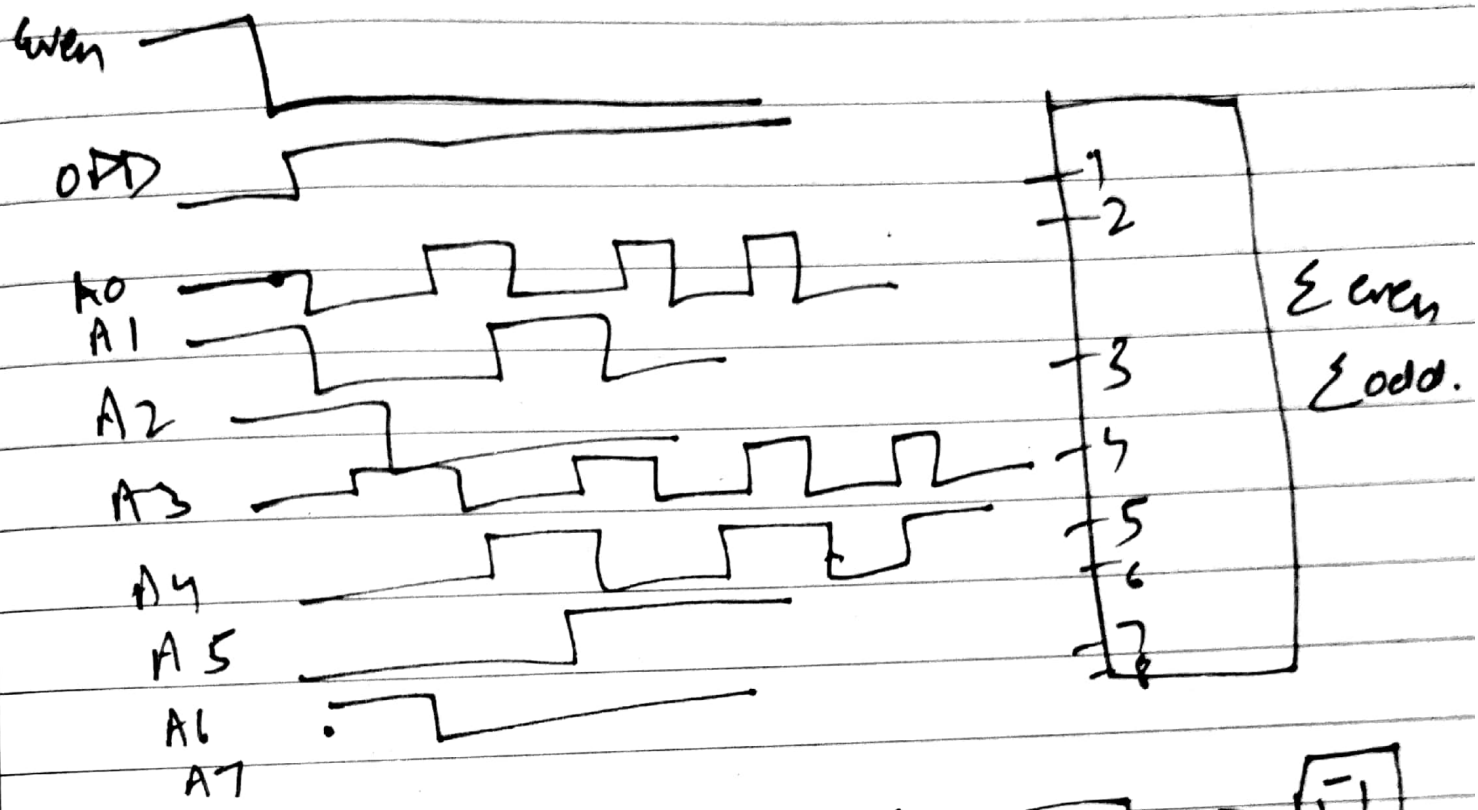


(21)



Even parity occurs both bits & when low

Q22



Q23.