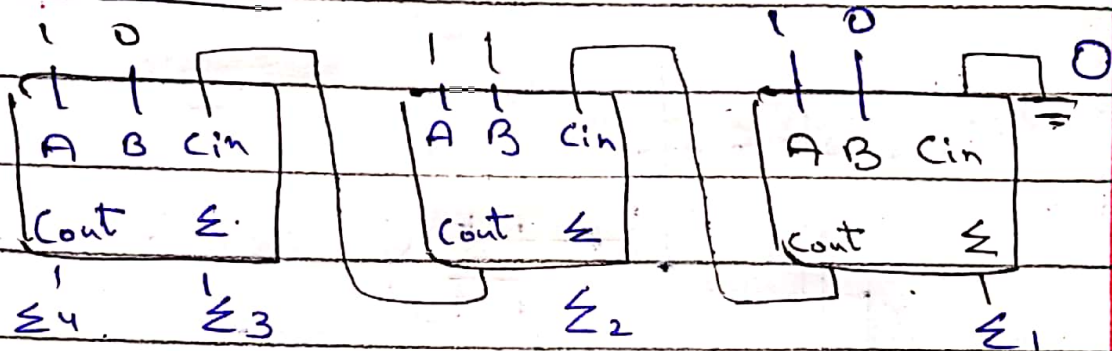


# Assignment #3.

Roll No = 20K-0409.

## Ques 1



$$\text{②} \quad \text{Cout} = 1 \quad \Sigma_2 = 0 \quad \text{①} \quad \text{Cout} = 0 \quad \Sigma_1 = 1$$

$$\text{③} \quad \text{Cout} = 1 \quad \Sigma_3 = 0.$$

$$\Sigma_4 \text{ or } \Sigma_4 = 1$$

We get,

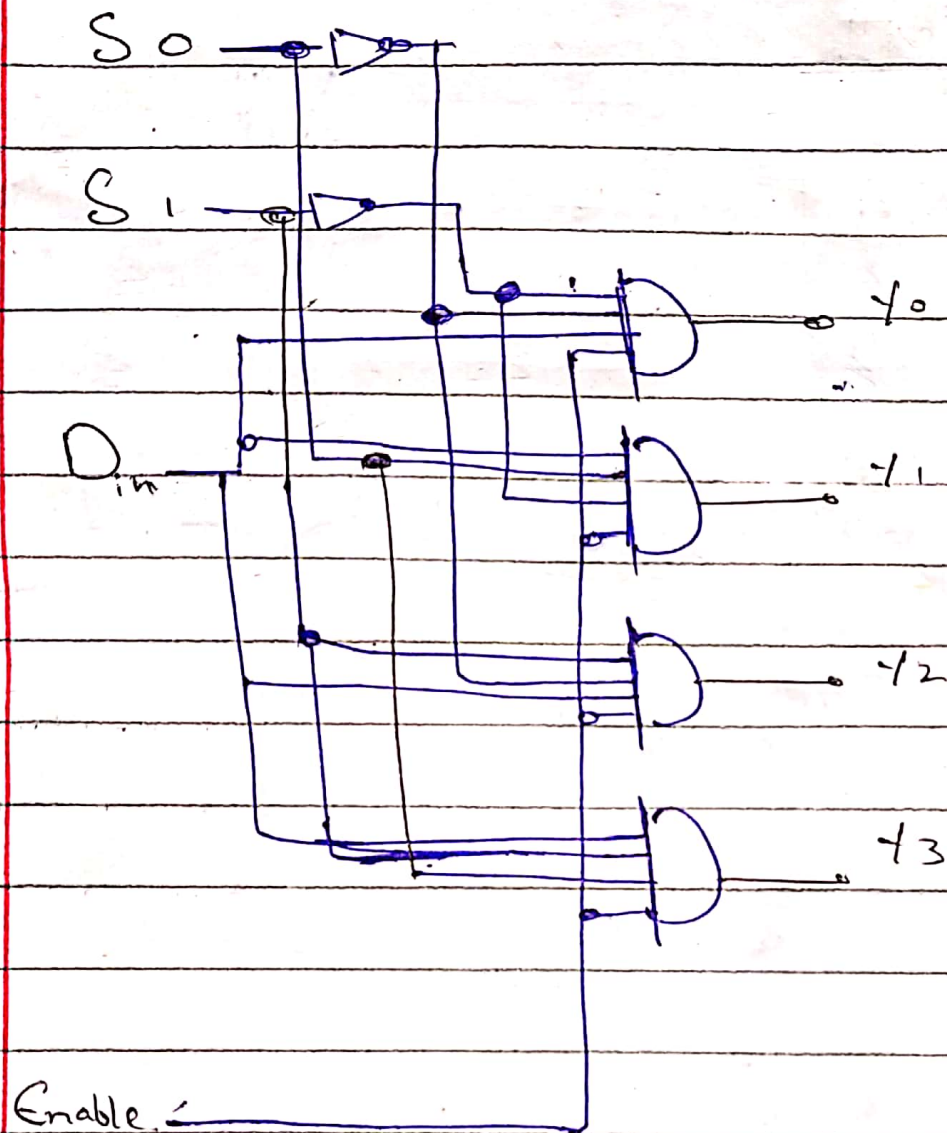
$$\begin{array}{cccc} \Sigma_4 & \Sigma_3 & \Sigma_2 & \Sigma_1 \\ 1 & 0 & 0 & 1 \end{array}$$

Long hand addition.

$$\begin{array}{r} 1 \\ 1 \quad 1 \quad 1 \\ + 0 \quad 1 \quad 10 \\ \hline 1 \quad 0 \quad 0 \quad 1 \end{array}$$

Ques 2

1-4 DeMux (i)



Logic expression.

$$Y_0 = S_1 S_0 D$$

$$Y_1 = S_1 \bar{S}_0 D$$

$$Y_2 = S_1 \bar{S}_0 D$$

$$Y_3 = S_1 S_0 D$$

## Truth Table

$S_1$	$S_0$	$D$	$\gamma_3$	$\gamma_2$	$\gamma_1$	$\gamma_0$
0	0	0	0	0	0	0
0	0	1	0	0	0	1
0	1	0	0	0	0	0
0	1	1	0	0	1	0
1	0	0	0	0	0	0
1	0	1	0	1	0	0
1	1	0	0	0	0	0
1	1	1	1	0	0	0

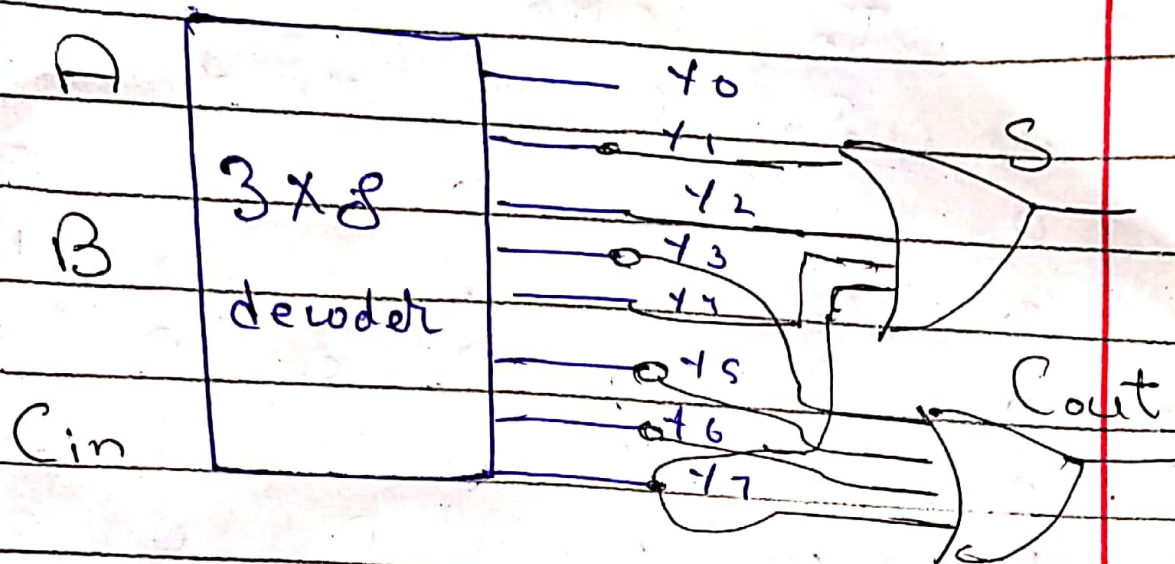
Part (2) Full adder implement  
using Decoder

## Truth Table

$A$	$B$	$C_{in}$	$S$	$C_{out}$	
0	0	0	0	0	$\gamma_0$
0	0	1	1	0	$\gamma_1$
0	1	0	1	0	$\gamma_2$
0	1	1	0	1	$\gamma_3$
1	0	0	1	0	$\gamma_4$
1	0	1	0	1	$\gamma_5$
1	1	0	0	1	$\gamma_6$
1	1	1	1	1	$\gamma_7$

$$F_S = \sum(\gamma_1, \gamma_2, \gamma_4, \gamma_7), F_{CO} = \sum(\gamma_3, \gamma_5, \gamma_6, \gamma_7)$$





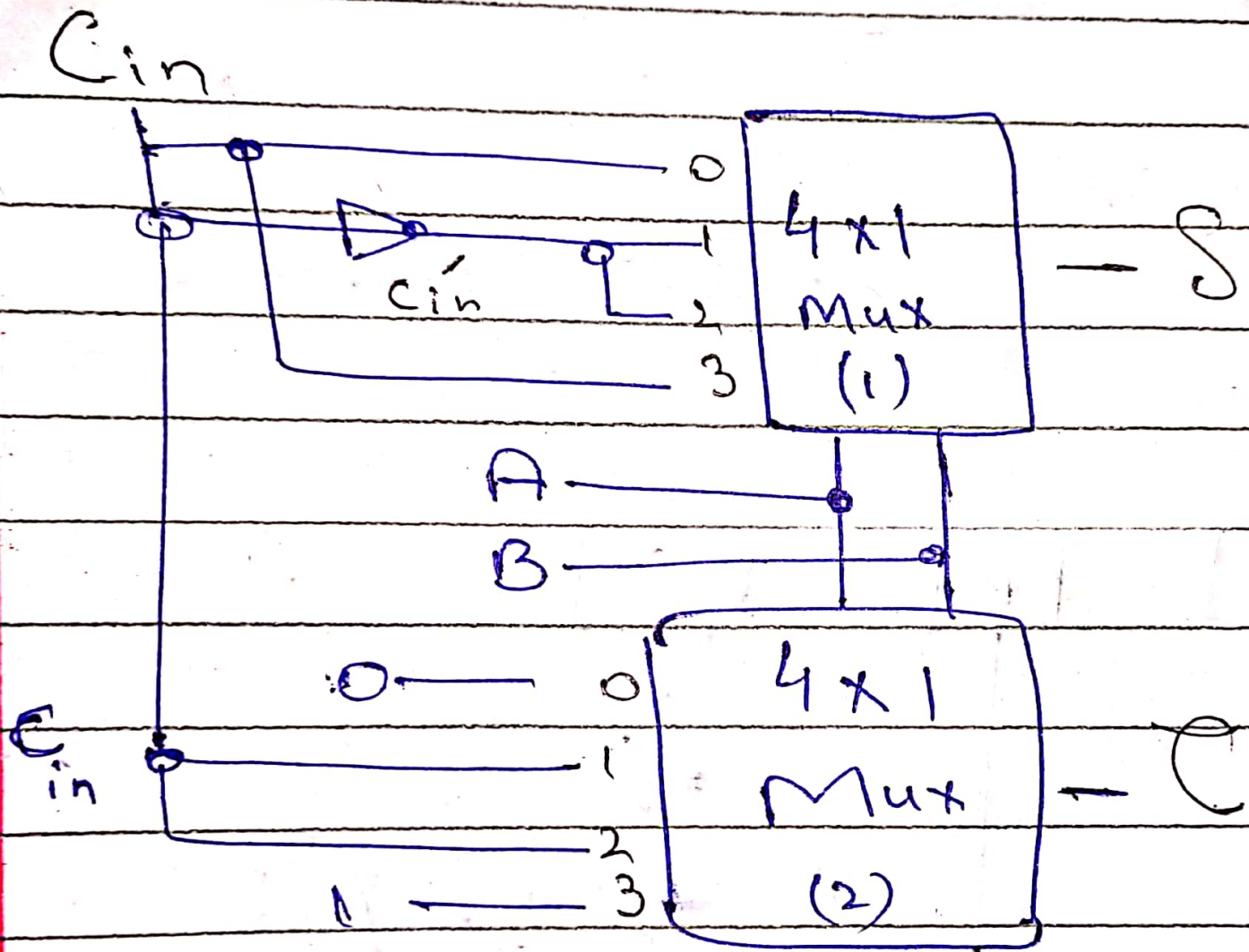
Part 3.

Implement full adder using  
4<sup>o</sup> 1 Multiplexer.

Truth Table.

A	B	Cin	S	Cout.
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

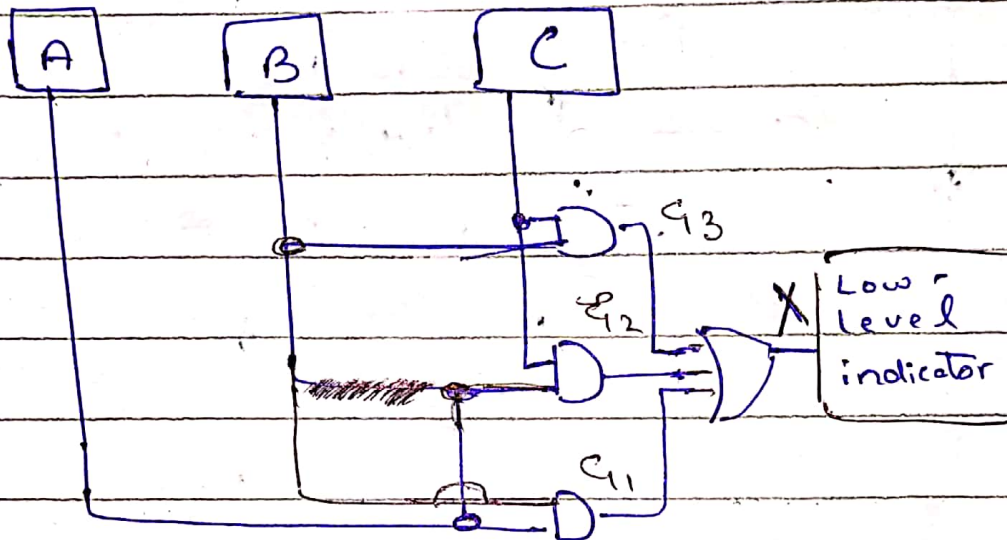
# Circuit Diagram.



### Ques 3

Solution.

circuit diagram



Explanation;

And gate  $G_1$  checks level in Tank A and B,  $G_2$  checks Tank A and C, and  $G_3$  checks Tanks B and C.

When chemical level in any of 2 tanks get too low, one of AND gate will have high inputs and leads to high output. Output X from OR gate is high. High input used to activate indicator.