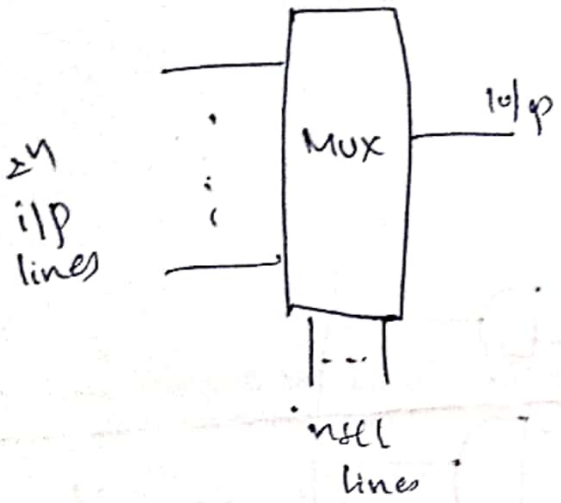
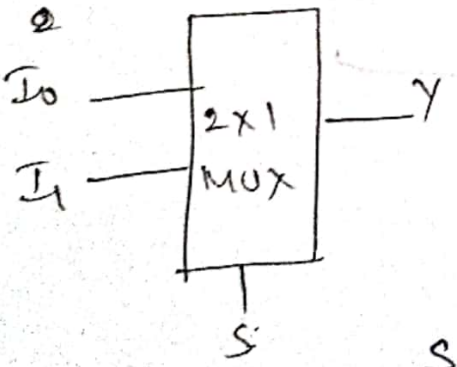
Multiplexer:

- A multiplexer is a combinational circuit that selects binary inf from one of many i/p lines and directs it to a single o/p line
- The selection of a particular i/p line is controlled by a set of selection lines

MUX is also called as data selector

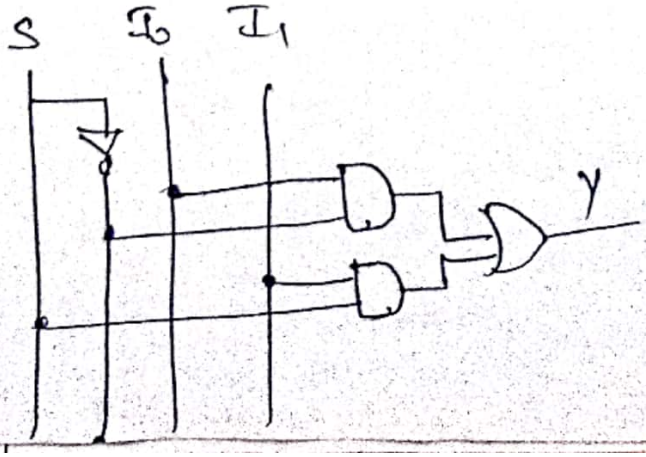


2:1 MUX:

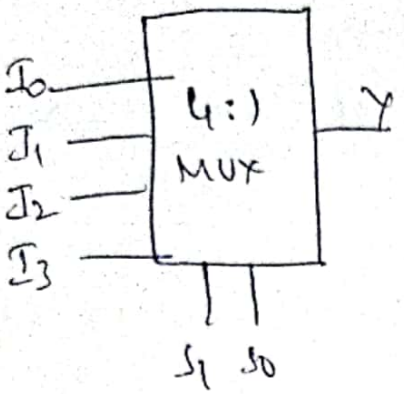


S	Y
0	I_0
1	I_1

$Y = I_0\bar{S} + I_1 S$

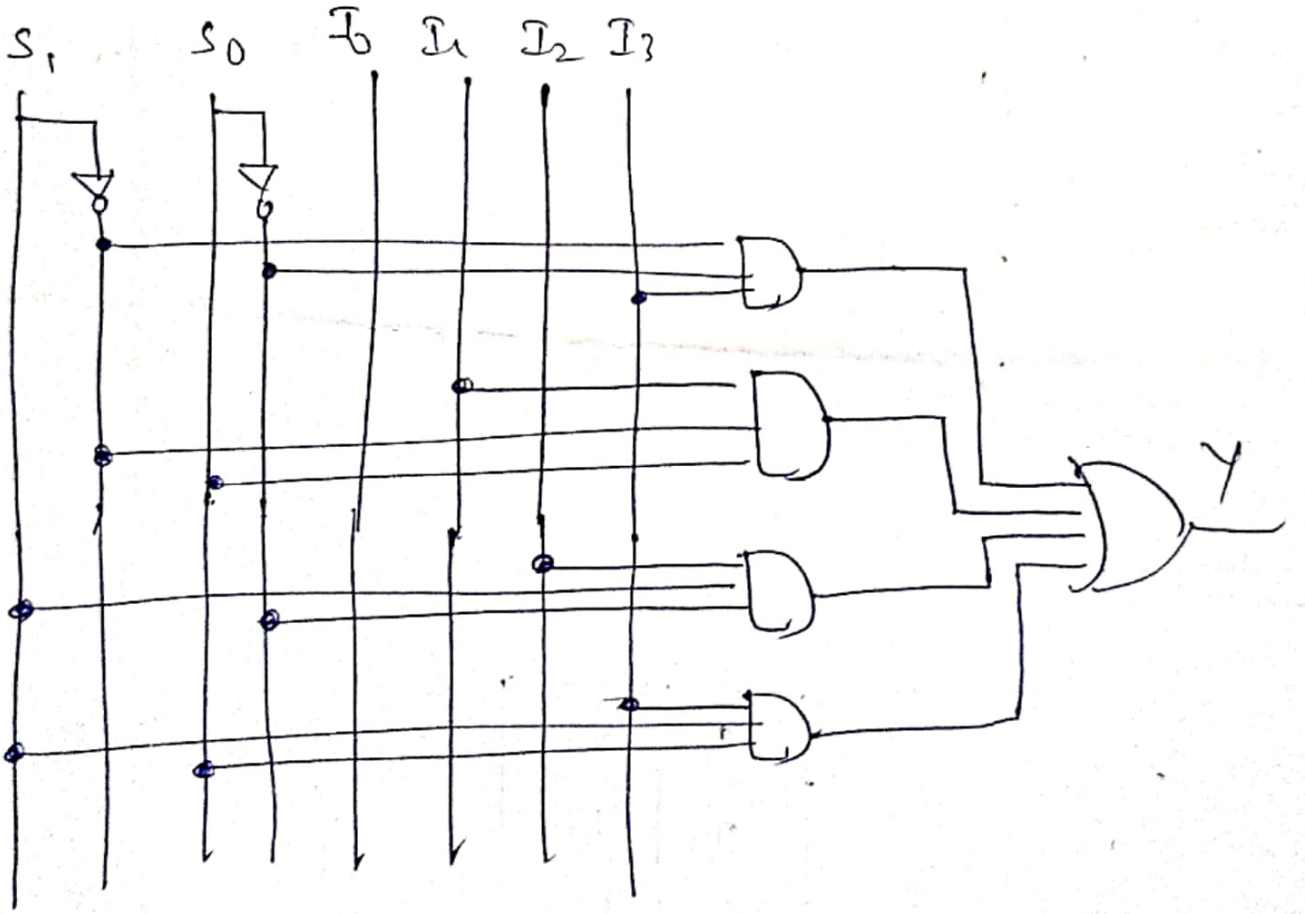


4:1 MUX



S_1	S_0	Y
0	0	I_0
0	1	I_1
1	0	I_2
1	1	I_3

$$Y = I_0 \bar{S}_1 \bar{S}_0 + I_1 \bar{S}_1 S_0 + I_2 S_1 \bar{S}_0 + I_3 S_1 S_0$$

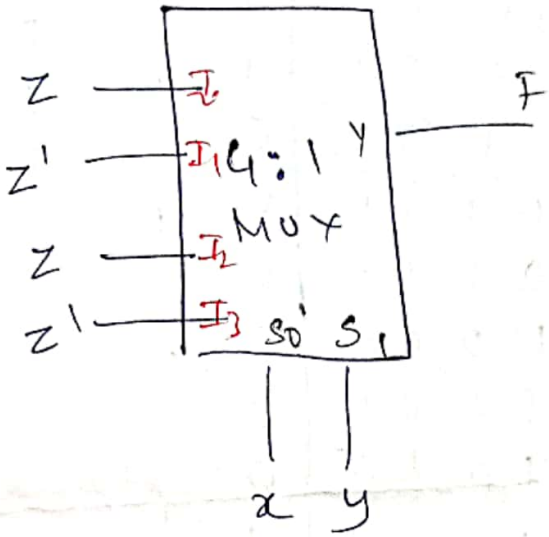


Implementation of Boolean fn. using a MUX:

Implement given boolean fn. using MUX.

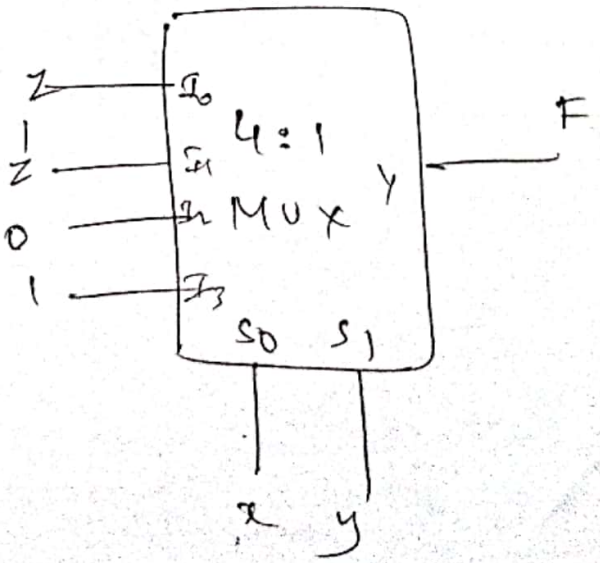
① $F(x,y,z) = \Sigma(1,3,5,6)$

	x	y	z	F	
0	0	0	0	0	z
1	0	0	1	1	
2	0	1	0	0	z
3	0	1	1	1	
4	1	0	0	0	z
5	1	0	1	1	
6	1	1	0	1	z'
7	1	1	1	0	



② $F(x,y,z) = \Sigma(1,2,6,7)$

	x	y	z	F	
0	0	0	0	0	z
1	0	0	1	1	
2	0	1	0	1	z'
3	0	1	1	0	
4	1	0	0	0	0
5	1	0	1	0	
6	1	1	0	1	1
7	1	1	1	1	



(3) $F(A,B,C,D) = \Sigma(1,3,4,11,12,13,14,15)$

A	B	C	D	F	
0	0	0	0	0	D
0	0	0	1	1	
0	0	1	0	0	D
0	0	1	1	1	
0	1	0	0	1	$\bar{D}$
0	1	0	1	0	
0	1	1	0	0	0
0	1	1	1	0	
1	0	0	0	0	0
1	0	0	1	0	
1	0	1	0	0	D
1	0	1	1	1	
1	1	0	0	1	1
1	1	0	1	1	
1	1	1	0	1	1
1	1	1	1	1