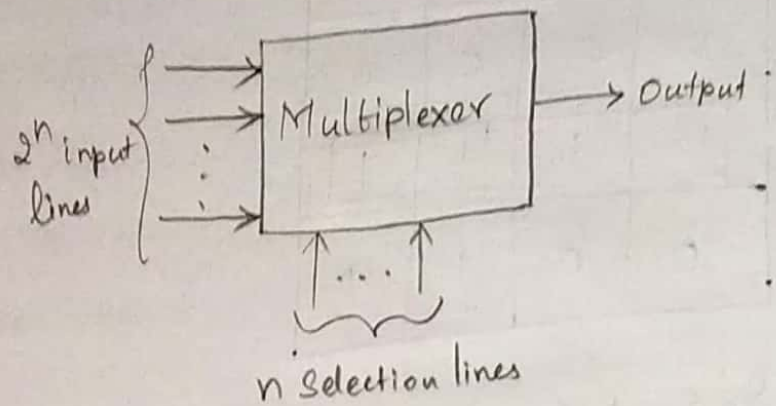
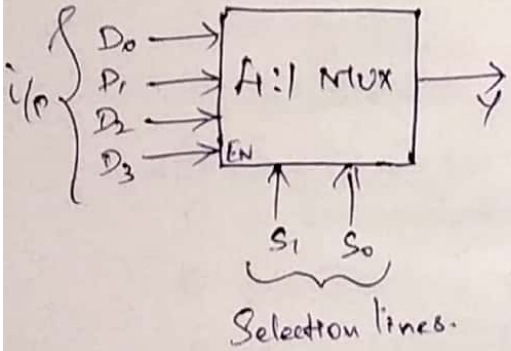
MULTIPLEXER.

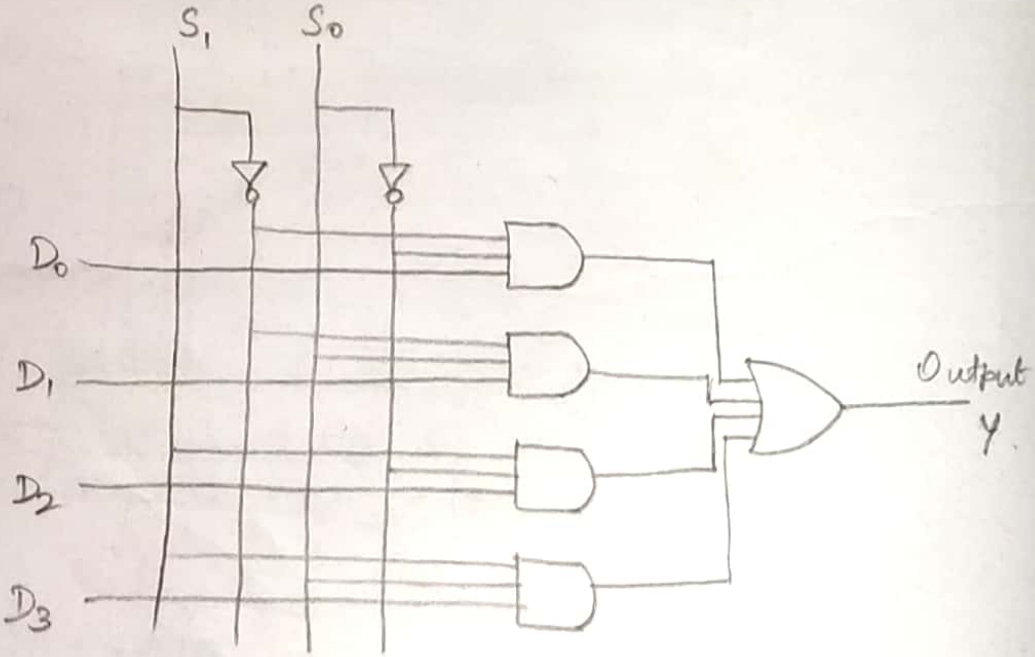


4:1 Multiplexer.

A 4:1 MUX has 4 inputs D_3, D_2, D_1, D_0, two selection lines (S_1 & S_0) and single output line 'Y'



S_1	S_0	Y
0	0	D_0
0	1	D_1
1	0	D_2
1	1	D_3



8:1 MULTIPLEXER.

Select lines			Output
S_2	S_1	S_0	Y
0	0	0	D_0
0	0	1	D_1
0	1	0	D_2
0	1	1	D_3
1	0	0	D_4
1	0	1	D_5
1	1	0	D_6
1	1	1	D_7

$$Y = \bar{S}_2 \bar{S}_1 \bar{S}_0 D_0 + \bar{S}_2 \bar{S}_1 S_0 D_1 + S_2 \bar{S}_1 S_0 D_2 + S_2 \bar{S}_1 \bar{S}_0 D_3 + \bar{S}_2 S_1 S_0 D_4 + \bar{S}_2 S_1 \bar{S}_0 D_5 + \bar{S}_2 \bar{S}_1 S_0 D_6 + \bar{S}_2 \bar{S}_1 \bar{S}_0 D_7$$

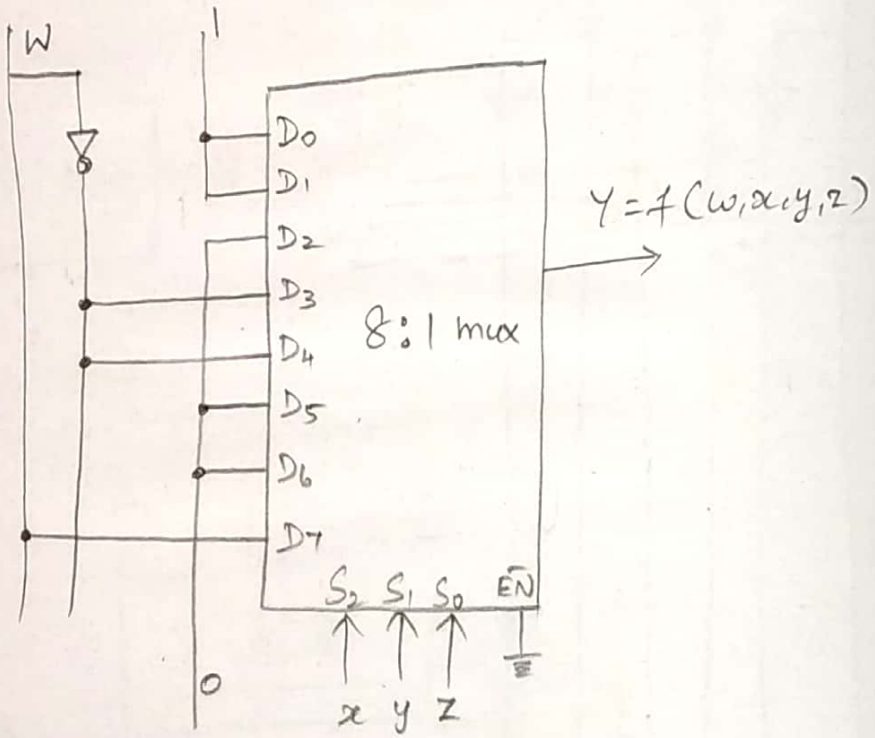
PROBLEM:

1) Implement the following Boolean function using Multiplexer.

$F(A,B,C,D) = \sum m\,(0,1,3,4,8,9,15)$

Solu:

	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
$\bar{A}$	(0)	(1)	2	(3)	(4)	5	6	7
A	(8)	(9)	10	11	12	13	14	(15)
	1	1	0	$\bar{A}$	$\bar{A}$	0	0	A



2) Implement the following Boolean function using 4:1 mux.

$f(w,x,y,z) = \sum_m (0,1,2,4,6,9,12,14)$

Soln:

	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
$\bar{w}$	0	1	2	3	4	5	6	7
w	8	9	10	11	12	13	14	15
	$\bar{w}$	1	$\bar{w}$	0	1	0	1	0