

TRUTH TABLES -

① 8X1 MUX

A_0	A_1	A_2	A_3	A_4	A_5	A_6	A_7	X_2	X_1	X_0	Y
0	X	X	X	X	X	X	X	0	0	0	0
1	X	X	X	X	X	X	X	0	0	0	1
X	0	X	X	X	X	X	X	0	0	1	0
X	1	X	X	X	X	X	X	0	0	1	1
X	X	0	X	X	X	X	X	0	1	0	0
X	X	1	X	X	X	X	X	0	1	0	1
X	X	X	0	X	X	X	X	0	1	1	0
X	X	X	1	X	X	X	X	0	1	1	1
X	X	X	X	0	X	X	X	1	0	0	0
X	X	X	X	1	X	X	X	1	0	0	1
X	X	X	X	X	0	X	X	1	0	1	0
X	X	X	X	X	1	X	X	1	0	1	1
X	X	X	X	X	X	0	X	1	1	0	0
X	X	X	X	X	X	1	X	1	1	0	1
X	X	X	X	X	X	X	0	1	1	1	0
X	X	X	X	X	X	X	1	1	1	1	1

② 1 X 8 DEMUX

X_2	X_1	X_0	IN	A_0	A_1	A_2	A_3	A_4	A_5	A_6	A_7
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0
0	0	1	1	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0
0	1	0	1	0	0	1	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0	0	0
0	1	1	1	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0
1	0	1	0	0	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	1	0	0
1	1	0	1	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	1	0
1	1	1	1	0	0	0	0	0	0	0	0
				0	0	0	0	0	0	0	1

③ 2X1 PRIORITY ENCODER

EN / $x_1 x_0$	00	01	11	10
0	0	0	0	0
1	0	0	1	1

EN	x_1	x_0	Y
0	x	x	0
1	0	1	0
1	1	0	1
1	1	1	1

~~Y = (EN) x_1~~
 $Y = (EN) x_1$

④ 1X2 DECODER

<u>x_0</u> EN / IN	0	1	EN	IN	x_1	x_0
0	0	0	0	x	0	0
1	1	0	1	0	0	1
			1	1	1	0

<u>x_1</u> EN / IN	0	1
0	0	0
1	0	1

$$x_0 = (EN) (\overline{IN})$$

$$x_1 = (EN) (IN)$$

K-MAPS

① 2x1 MUX

$A_1 A_0 \backslash X_0$	0	1
00	0	0
01	1	0
11	1	1
10	0	1

A_1	A_0	X_0	Y
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$$Y = A_0 \bar{X}_0 + A_1 X_0$$

② 1x2 DEMUX

A_0	$IN \backslash X_0$	0	1
0	0	0	0
1	1	1	0

IN	X_0	A_1	A_0
0	0	0	0
0	1	0	0
1	0	0	1
1	1	1	0

A_1	$IN \backslash X_0$	0	1
0	0	0	0
1	1	0	1

$$A_0 = (IN) \bar{X}_0$$

$$A_1 = (IN) X_0$$

③ 8X3 PRIORITY ENCODER

EN	A ₇	A ₆	A ₅	A ₄	A ₃	A ₂	A ₁	A ₀	X ₂	X ₁	X ₀
0	x	x	x	x	x	x	x	x	0	0	0
1	0	0	0	0	0	0	0	1	0	0	0
1	0	0	0	0	0	0	1	x	0	0	1
1	0	0	0	0	0	1	x	x	0	1	0
1	0	0	0	0	1	x	x	x	0	1	1
1	0	0	0	1	x	x	x	x	1	0	0
1	0	0	1	x	x	x	x	x	1	0	1
1	0	1	x	x	x	x	x	x	1	1	0
1	1	x	x	x	x	x	x	x	1	1	1

④ 3X8 DECODER

EN	X ₂	X ₁	X ₀	A ₇	A ₆	A ₅	A ₄	A ₃	A ₂	A ₁	A ₀
0	x	x	x	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1
1	0	0	1	0	0	0	0	0	0	1	0
1	0	1	0	0	0	0	0	0	1	0	0
1	0	1	1	0	0	0	0	1	0	0	0
1	1	0	0	0	0	0	1	0	0	0	0
1	1	0	1	0	0	1	0	0	0	0	0
1	1	1	0	0	1	0	0	0	0	0	0
1	1	1	1	1	0	0	0	0	0	0	0