

①

⇒

If x is Prime $\gamma \rightarrow 01$

If x is 6 's multiple $\gamma \rightarrow 10$

else $\gamma \rightarrow 00$

Truth table,

x_3	x_2	x_1	x_0	γ_1, γ_0	
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	2
0	0	1	1	0	3
0	1	0	0	0	4
0	1	0	1	0	5
0	1	1	0	1	6
0	1	1	1	0	7
1	0	0	0	0	8
1	0	0	1	0	9
1	0	1	0	0	10
1	0	1	1	0	11
1	1	0	0	0	12
1	1	0	1	0	13
1	1	1	0	0	14
1	1	1	1	0	15

For Y_1 ,

$x_3 x_2$	$x_1 x_0$		11	10
	00	01		
00	0	0	0	0
01	0	0	0	1
11	1	0	0	0
10	0	0	0	0

$$Y_1 = x_3 x_2 \bar{x}_1 \bar{x}_0 + \bar{x}_3 x_2 x_1 \bar{x}_0$$

$$Y_1 = \bar{x}_0 x_2 (x_3 \bar{x}_1 + \bar{x}_3 x_1)$$

$$Y_1 = \bar{x}_0 x_2 (x_3 \oplus x_1)$$

For Y_0 ,

$x_3 x_2$	$x_1 x_0$		11	10
	00	01		
00	0	0	1	0
01	0	1	1	0
11	0	1	0	0
10	0	0	1	0

$$Y_0 = x_1 x_0 \bar{x}_3 + \bar{x}_3 \bar{x}_2 x_0 + \bar{x}_1 x_0 x_2 + x_3 \bar{x}_2 x_1 x_0$$

$$Y_0 = x_0 \bar{x}_3 (x_1 + x_2) + x_0 (\bar{x}_1 x_2 + x_1 \bar{x}_2 x_3)$$

