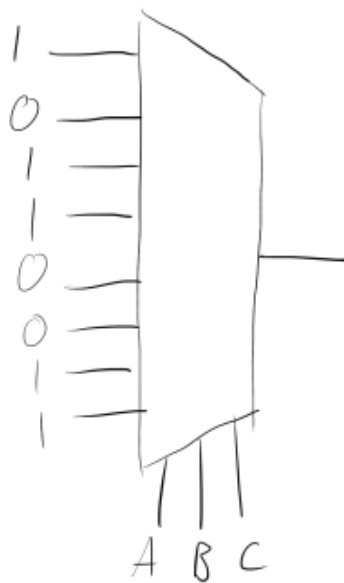


1a)

$$\begin{aligned} X &= \overline{A}.B.C + \overline{B}.\overline{C} + B.C \\ &= \overline{B} + C + B.C \\ &= \overline{B} + C \end{aligned}$$

$$\begin{aligned} Y &= \overline{(A+B+C)}.D + A.D + B \\ &= \overline{A}.\overline{B}.\overline{C}.D + A.D + B.D + B \\ &= (\overline{A}.\overline{B}.\overline{C} + A + B).D + B \\ &= (\overline{C} + A + B).D + B \\ &= A.D + B + \overline{C}.D \end{aligned}$$

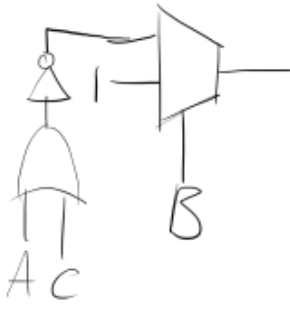
b) (i)



(ii)



(iii)



c)

(i)

I_7	I_6	I_5	I_4	I_3	I_2	I_1	I_0	O_2	O_1	O_0	None
0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	1	x	0	0	1	0
0	0	0	0	0	1	x	x	0	1	0	0
0	0	0	0	1	x	x	x	0	1	1	0
0	0	0	1	x	x	x	x	1	0	0	0
0	0	1	x	x	x	x	x	1	0	1	0
0	1	x	x	x	x	x	x	1	1	0	0
1	x	x	x	x	x	x	x	1	1	1	0

(ii)

$$O_2 = I_4 + I_5 + I_6 + I_7$$

$$O_1 = I_2 + I_3 + I_6 + I_7$$

$$O_0 = I_1 + I_3 + I_5 + I_7$$

$$\text{None} = \overline{I_0 + I_1 + I_2 + I_3 + I_4 + I_5 + I_6 + I_7}$$