

7/1/23

DLD - ASSIGNMENT - 7

NAME:

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Aim:

To verify Encoders by using Truth table and Logisim

Software used:

1. Logisim Software.

1) 4-2 Encoder Circuit:

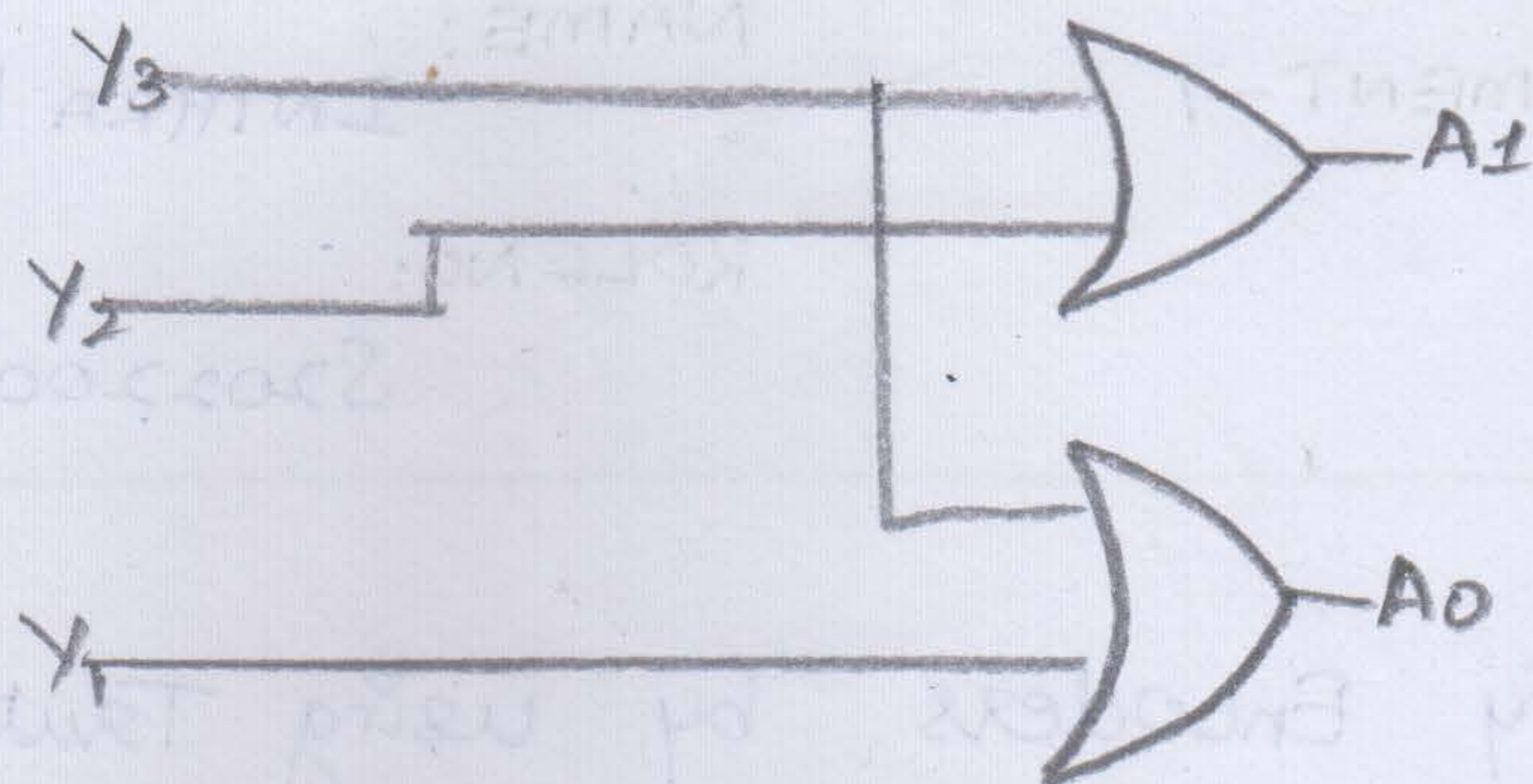
TRUTH TABLE:

INPUTS				OUTPUTS	
Y_3	Y_2	Y_1	Y_0	A_1	A_0
0	0	0	1	0	0
0	0	1	0	0	1
0	1	0	0	1	0
1	0	0	0	1	1

EXPRESSION:

$$A_1 = Y_3 + Y_2$$

$$A_0 = Y_3 + Y_1$$



4-2 PRIORITY ENCODER:

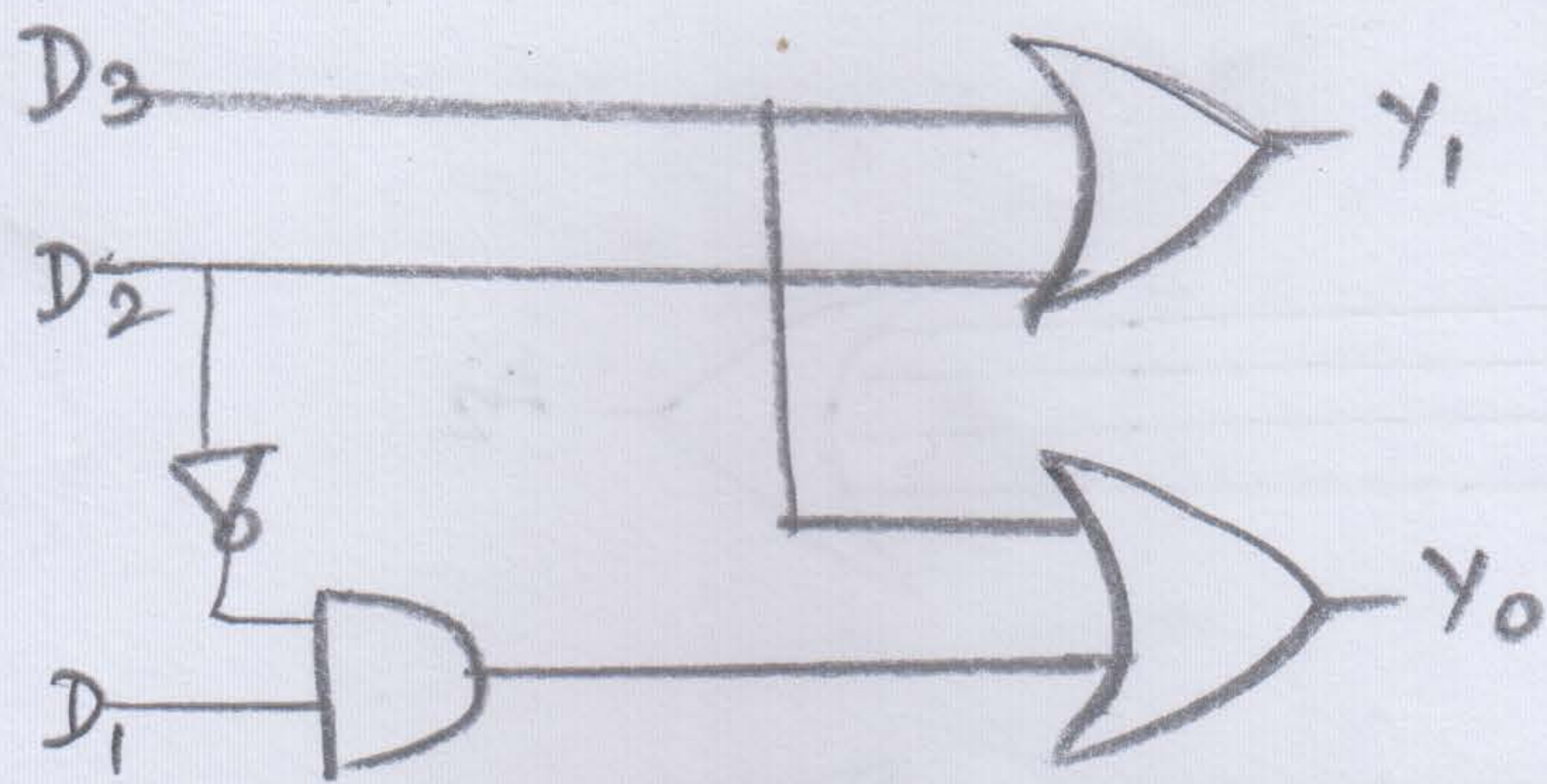
TRUTH TABLE:

INPUTS				OUTPUTS	
D_3	D_2	D_1	D_0	Y_1	Y_0
0	0	0	0	x	x
0	0	0	1	0	0
0	0	1	x	0	1
0	1	x	x	1	0
1	x	x	x	1	1

EXPRESSION:

$$Y_1 = D_3 + D_2$$

$$Y_0 = D_3 + D_2 D_1$$



8-3 ENCODER:

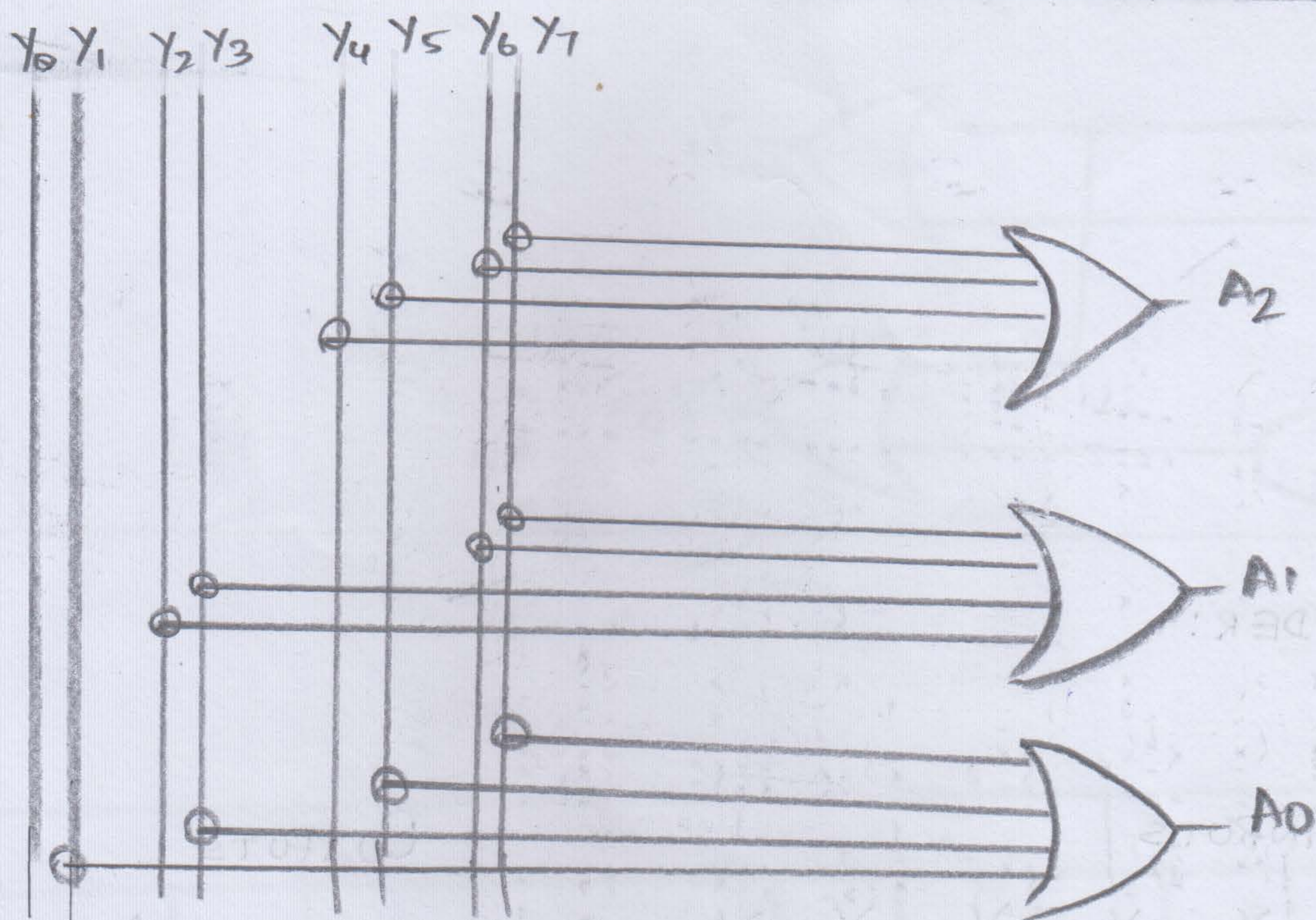
TRUTH TABLE:

INPUTS								OUTPUTS		
Y_7	Y_6	Y_5	Y_4	Y_3	Y_2	Y_1	Y_0	A_2	A_1	A_0
0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	1	0	0	0	1
0	0	0	0	0	1	0	0	0	1	0
0	0	0	0	1	0	0	0	0	1	1
0	0	0	1	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	1	0	1
0	1	0	0	0	0	0	0	1	1	0
1	0	0	0	0	0	0	0	1	1	1

$$A_0 = Y_7 + Y_5 + Y_3 + Y_1$$

$$A_1 = Y_7 + Y_6 + Y_3 + Y_2$$

$$A_2 = Y_7 + Y_6 + Y_5 + Y_4$$



16-4 ENCODER:

EXPRESSIONS:

$$A_0 = Y_1 + Y_3 + Y_5 + Y_7 + Y_9 + Y_{11} + Y_{13} + Y_{15}$$

$$A_1 = Y_2 + Y_3 + Y_6 + Y_7 + Y_{10} + Y_{11} + Y_{14} + Y_{15}$$

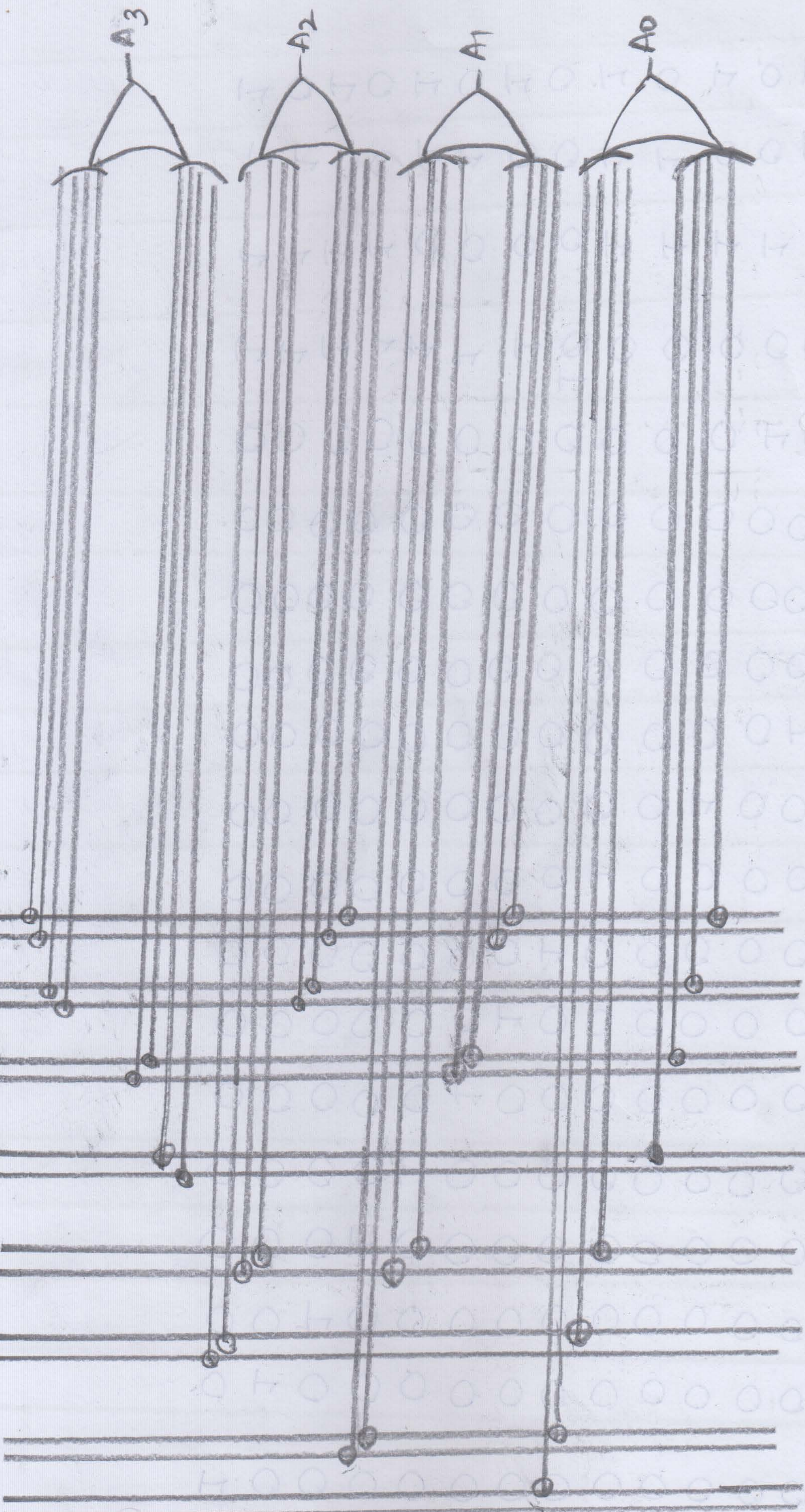
$$A_2 = Y_4 + Y_5 + Y_6 + Y_7 + Y_{15} + Y_{14} + Y_{13} + Y_{12}$$

$$A_3 = Y_8 + Y_9 + Y_{10} + Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15}$$

TRUTH TABLE:

[illegible]

Y0 Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8 Y9 Y10 Y11 Y12 Y13 Y14 Y15



8-3 PRIORITY ENCODER

INPUTS								OUTPUTS		
Y_7	Y_6	Y_5	Y_4	Y_3	Y_2	Y_1	Y_0	A_2	A_1	A_0
0	0	0	0	0	0	0	0	x	x	x
0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	1	x	0	0	1
0	0	0	0	0	1	x	x	0	1	0
0	0	0	0	1	x	x	x	0	1	1
0	0	1	x	x	x	x	x	1	0	0
0	1	x	x	x	x	x	x	1	0	1
1	x	x	x	x	x	x	x	1	1	0
								1	1	1

EXPRESSIONS:

$$B_2 = D_4 + D_5 + D_6 + D_7$$

$$B_1 = \overline{D_5} \overline{D_4} [D_3 + D_2] + D_6 + D_7$$

$$B_0 = \overline{D_6} [\overline{D_4} \overline{D_3} \overline{D_2} D_1 + \overline{D_4} D_3 + D_5] + D_7$$

16-4 Priority Encoder.

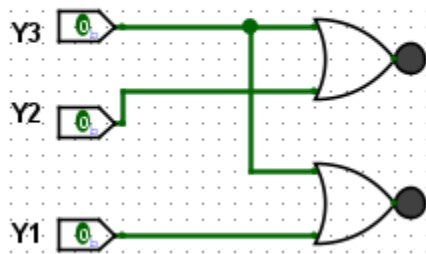
Inputs																Outputs			
Y ₁₅	Y ₁₄	Y ₁₃	Y ₁₂	Y ₁₁	Y ₁₀	Y ₉	Y ₈	Y ₇	Y ₆	Y ₅	Y ₄	Y ₃	Y ₂	Y ₁	Y ₀	A ₃	A ₂	A ₁	A ₀
1 0000000000000000	x 1000000000000000	x x 1000000000000000	x x x 1000000000000000	x x x x 1000000000000000	x x x x x 1000000000000000	x x x x x x 1000000000000000	x x x x x x x 1000000000000000	x x x x x x x x 1000000000000000	x x x x x x x x x 1000000000000000	x x x x x x x x x x 1000000000000000	x x x x x x x x x x x 1000000000000000	x x x x x x x x x x x x 1000000000000000	x x x x x x x x x x x x x 1000000000000000	x x x x x x x x x x x x x x 1000000000000000	0 1 x x x x x x x x x x x x x x x 1000000000000000	x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Conclusion:

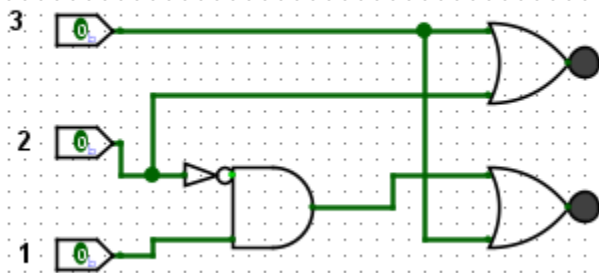
The Emoders and Priority Emoders are
verified in Logisim and with Truth table.

APPENDIX:

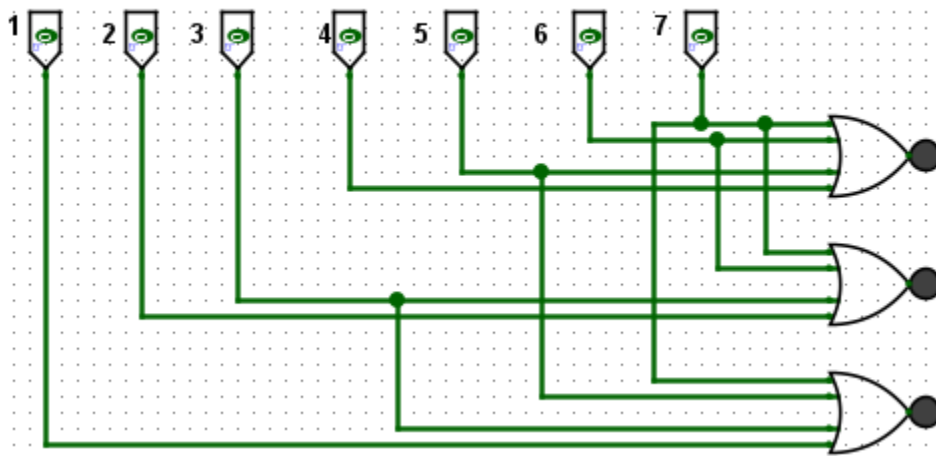
4.2 ENCODER



4.2 PRIORITY ENCODER



8.3 ENCODER



16 - 4 ENCODER

