

30/12/22

DLD ASSIGNMENT - 5

NAME:

A INTHRA KUMAR

ROLLNO:

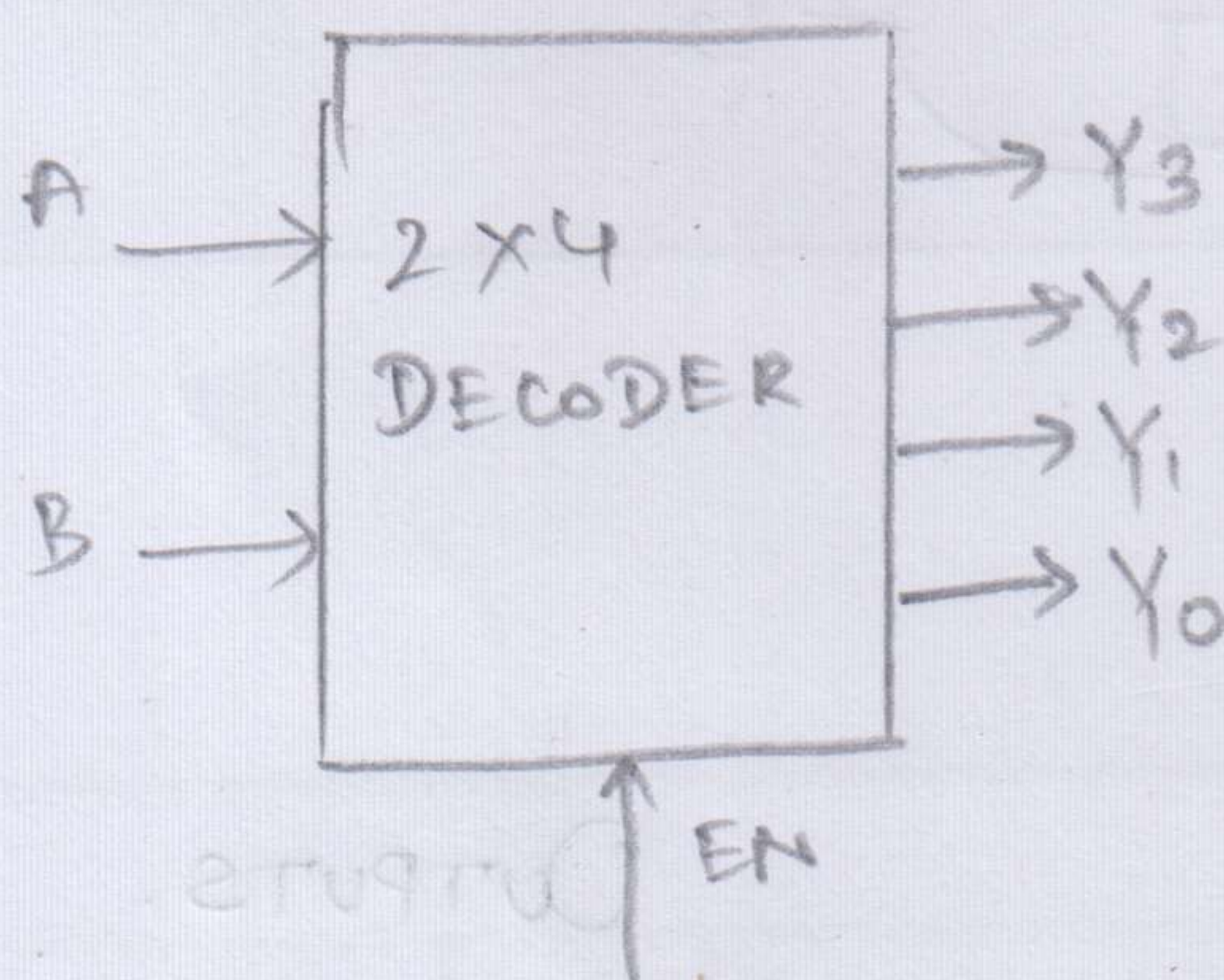
S20220010085

Aim:

Implementing decoders (2-4, 3-8, 4-16).

SOFTWARE USED:

1. Logisim software

1) 2-4 Decoder:TRUTH TABLE:

INPUTS			OUTPUTS			
EN	A	B	Y ₃	Y ₂	Y ₁	Y ₀
0	x	x	0	0	0	0
1	0	0	0	0	0	1
1	0	1	0	0	1	0
1	1	0	0	1	0	0
1	1	1	1	0	0	0

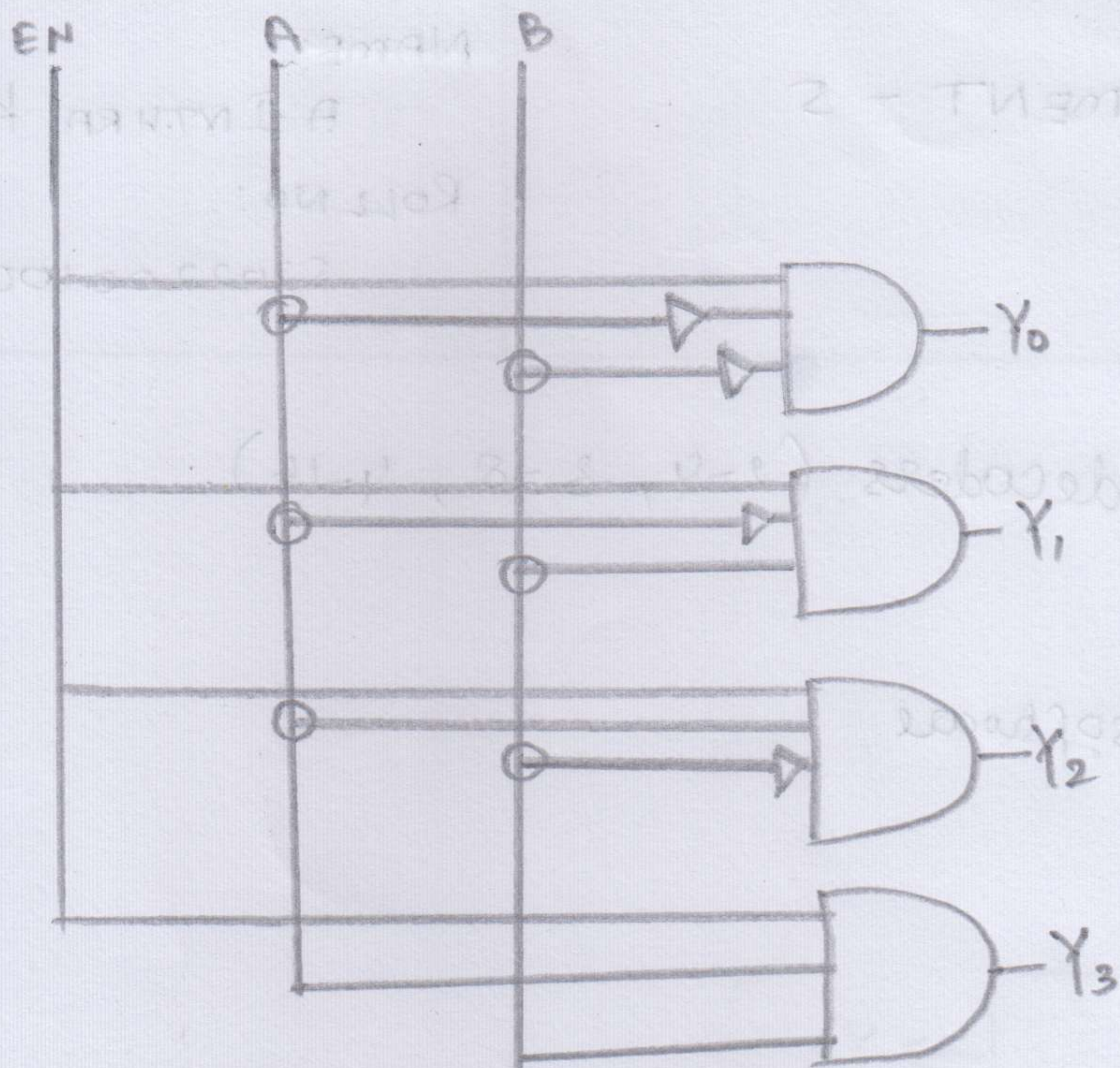
EXPRESSIONS:

$$Y_0 = A'B'EN$$

$$Y_1 = A'BEN$$

$$Y_2 = AB'EN$$

$$Y_3 = ABEN$$



2x4 DECODER.

2) 3x8 DECODER
TRUTH TABLE:

INPUTS				OUTPUTS.							
EN	A	B	C	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇
0	x	x	x	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	0	0	0	0
1	0	0	1	0	1	0	0	0	0	0	0
1	0	1	0	0	0	1	0	0	0	0	0
1	0	1	1	0	0	0	1	0	0	0	0
1	1	0	0	0	0	0	0	1	0	0	0
1	1	0	1	0	0	0	0	0	1	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	1

EXPRESSIONS:

$$Y_0 = EN \cdot A' \cdot B' \cdot C'$$

$$Y_1 = EN \cdot A' \cdot B' \cdot C$$

$$Y_2 = EN \cdot A' \cdot B \cdot C'$$

$$Y_3 = EN \cdot A' \cdot B \cdot C$$

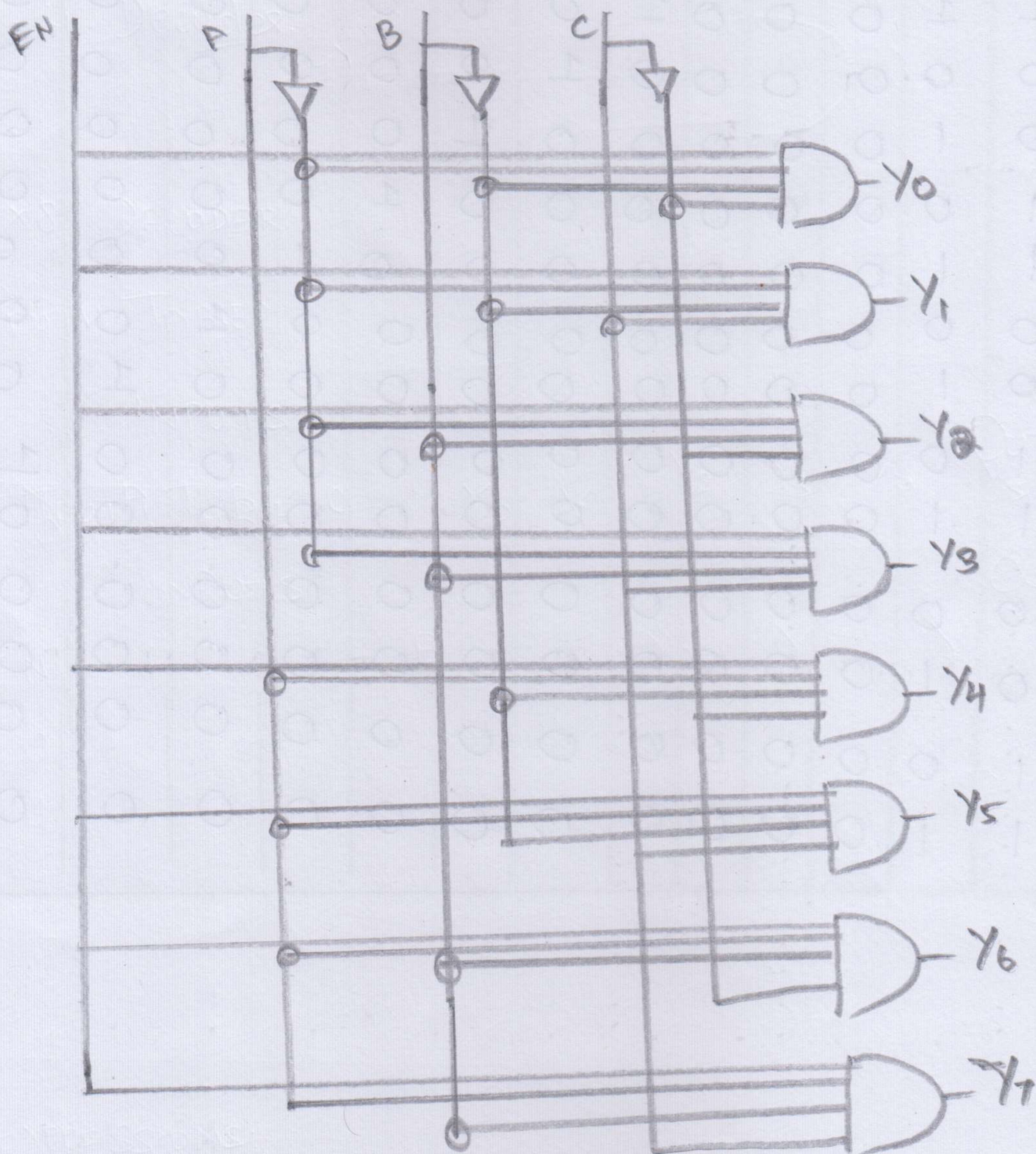
$$Y_4 = EN \cdot A \cdot B' \cdot C'$$

$$Y_5 = EN \cdot A \cdot B' \cdot C$$

$$Y_6 = EN \cdot A \cdot B \cdot C'$$

$$Y_7 = EN \cdot A \cdot B \cdot C$$

3x8 DECODER:



[illegible]

Y_{11}	Y_{12}	Y_{13}	Y_{14}	Y_{15}
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	0
0	1	0	0	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	1

EXPRESSIONS:

$$Y_0 = EN \cdot A' \cdot B' \cdot C' \cdot D'$$

$$Y_1 = EN \cdot A' \cdot B' \cdot C' \cdot D$$

$$Y_2 = EN \cdot A' \cdot B' \cdot C \cdot D'$$

$$Y_3 = EN \cdot A' \cdot B' \cdot C' \cdot D$$

$$Y_4 = EN \cdot A' \cdot B \cdot C' \cdot D'$$

$$Y_5 = EN \cdot A' \cdot B \cdot C \cdot D'$$

$$Y_6 = EN \cdot A' \cdot B \cdot C' \cdot D$$

$$Y_7 = EN \cdot A' \cdot B \cdot C \cdot D$$

$$Y_8 = EN \cdot A \cdot B' \cdot C \cdot D'$$

$$Y_9 = EN \cdot A \cdot B' \cdot C \cdot D$$

$$Y_{10} = EN \cdot A \cdot B' \cdot C' \cdot D'$$

$$Y_{11} = EN \cdot A \cdot B' \cdot C' \cdot D$$

$$Y_{12} = EN \cdot A \cdot B \cdot C \cdot D'$$

$$Y_{13} = EN \cdot A \cdot B \cdot C' \cdot D$$

$$Y_{14} = EN \cdot A \cdot B \cdot C' \cdot D'$$

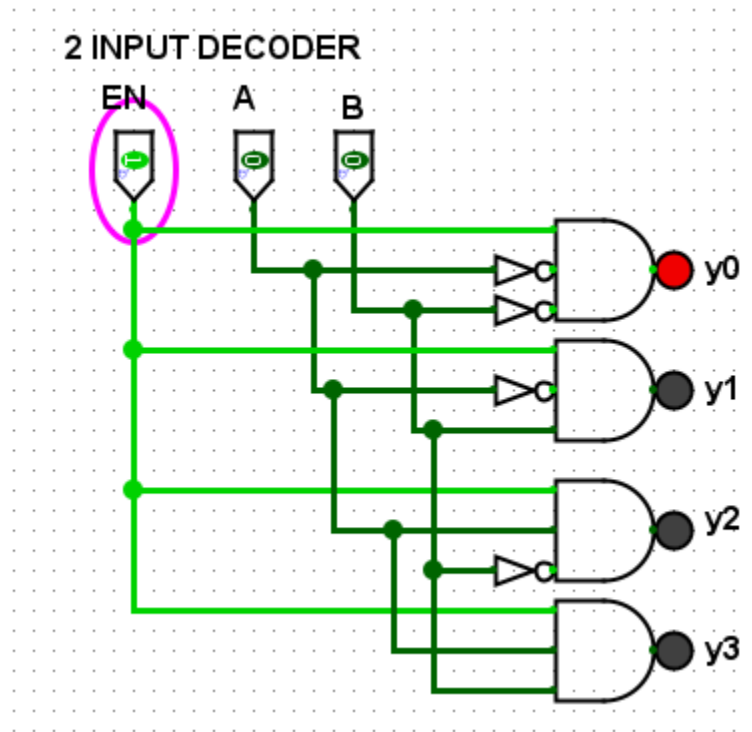
$$Y_{15} = EN \cdot A \cdot B \cdot C \cdot D$$

Conclusion:

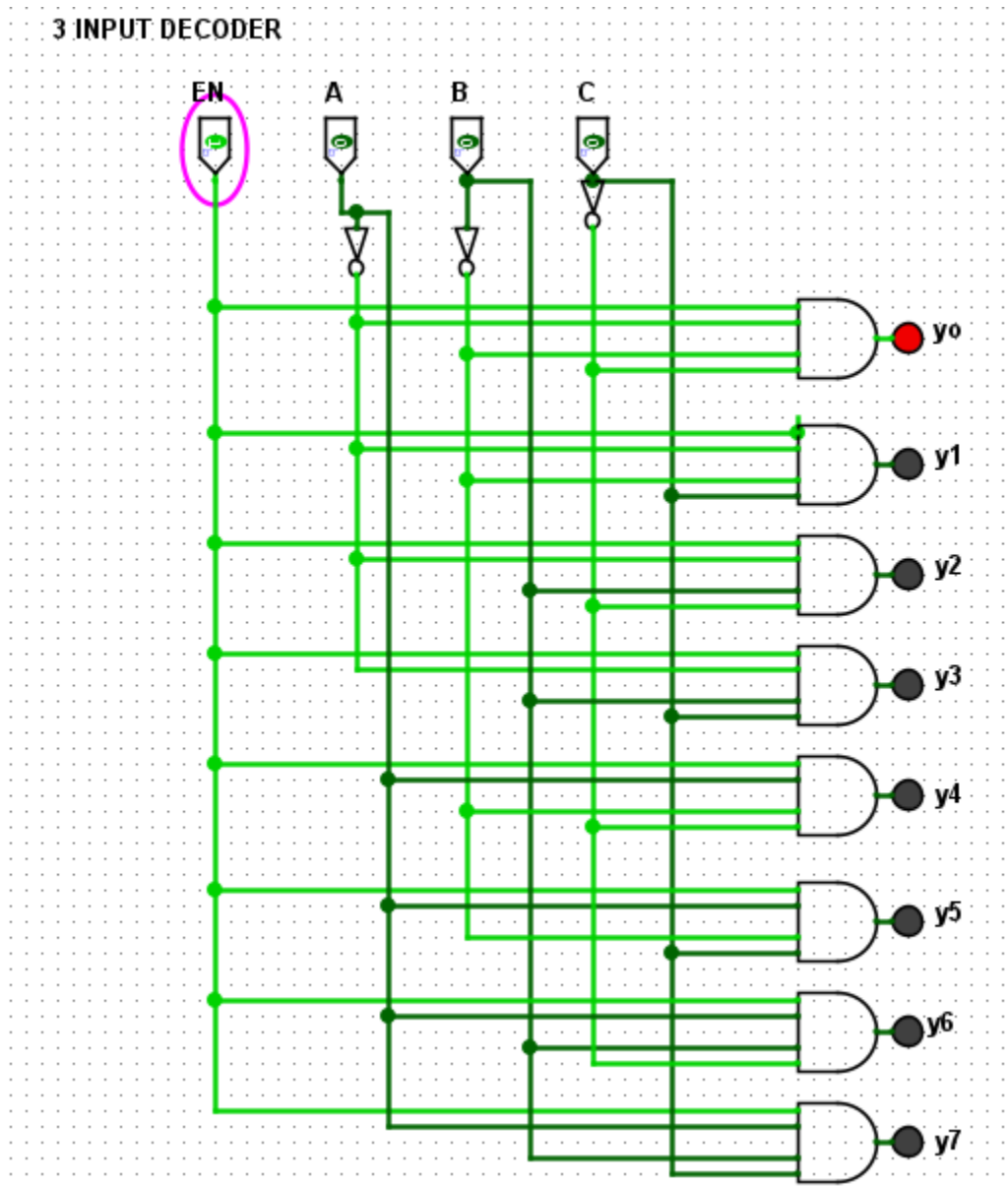
The Decoders are executed in Logisim software and verified with truth table.

APPENDIX:

2x4 DECODER:



3X8 DECODER:



4X16 DECODER:

