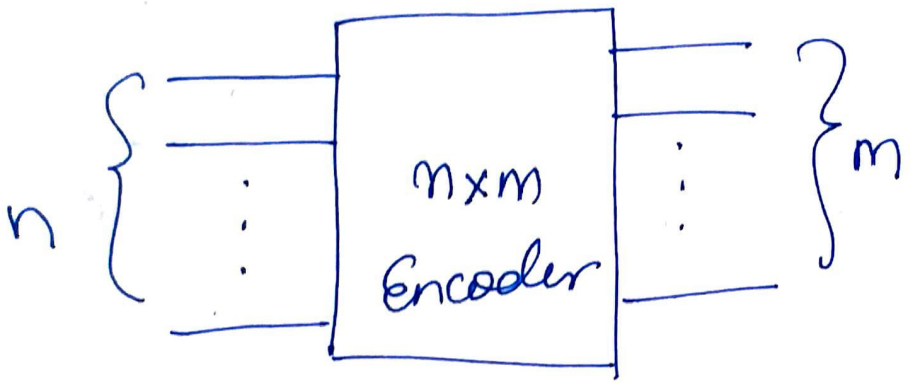
Introduction to Encoders & Decoders

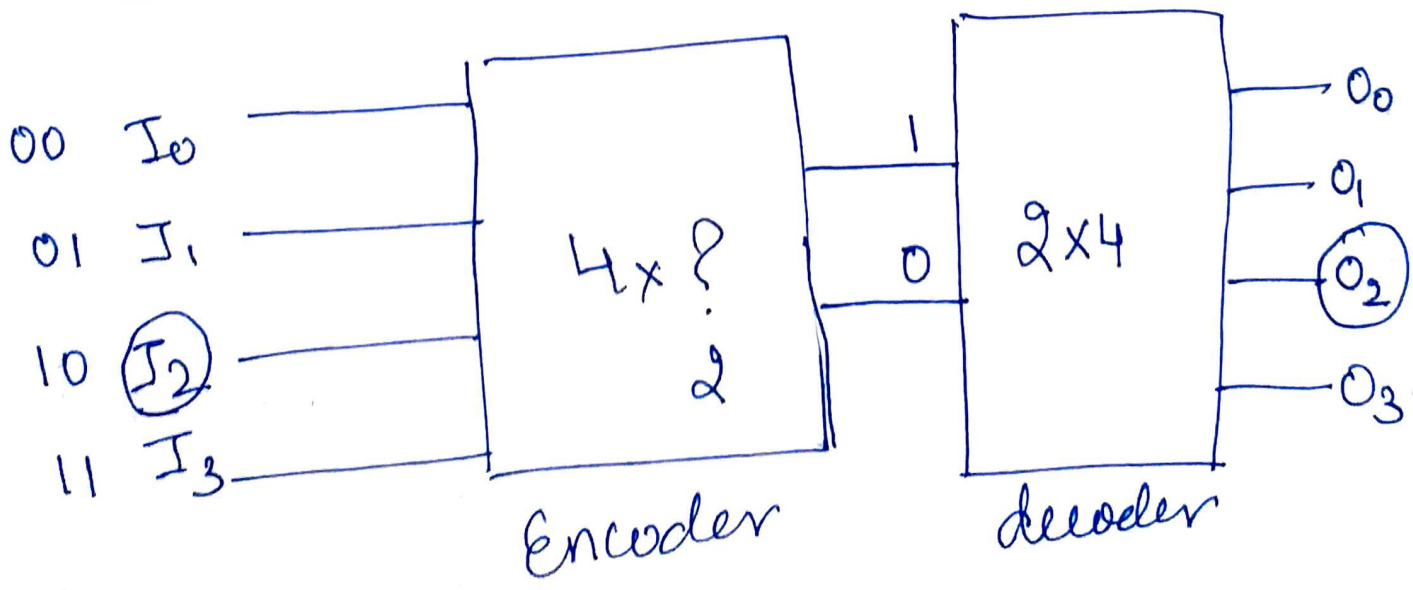
↳ They are combinational circuits.

↳ Encoders have "n" inputs & "m" outputs.

↳ Function of decoder is opposite to encoder



↳ Encoder



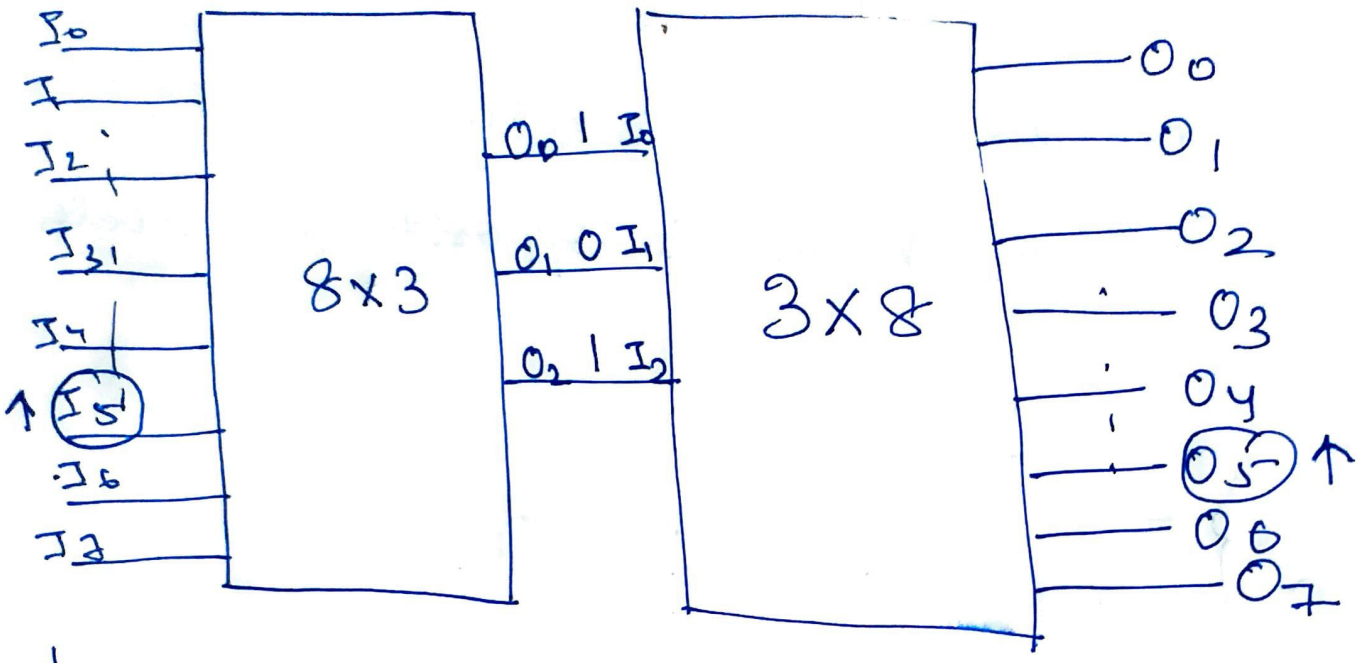
$n = 4$

$n = 2^2 \rightarrow m$

↳ no. of o/p

$n = 2^m$

} Encoder & decoder is reverse.



↳ Appln

Express Boolean Expression by reducing the connections.

Types of Encoder

i) Priority Encoder

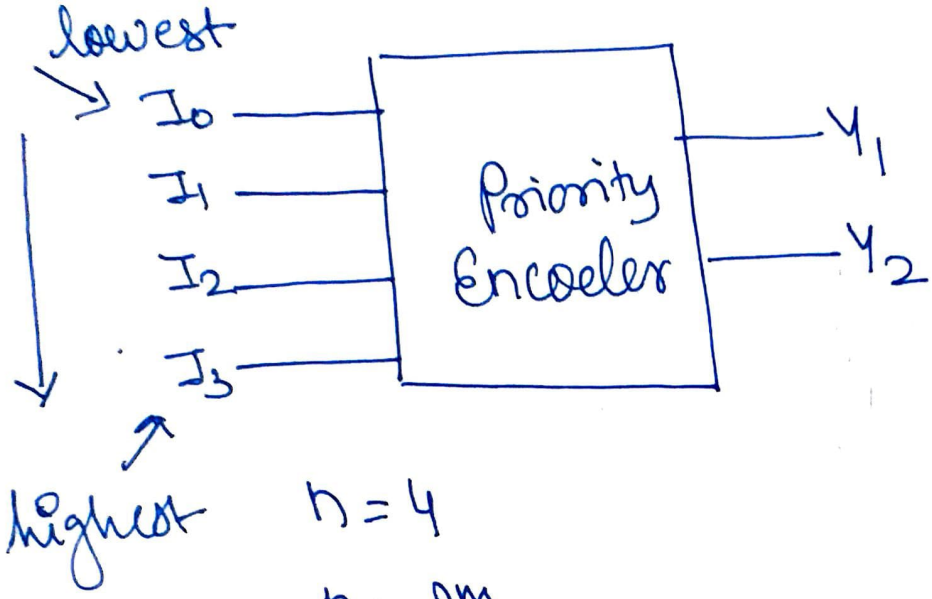
* If more than one IP is high, the priority has to given (smallest priority or largest priority

2) Decimal to BCD.

3) Octal to binary

4) Hex to binary.

Priority Encoder



$n = 4$

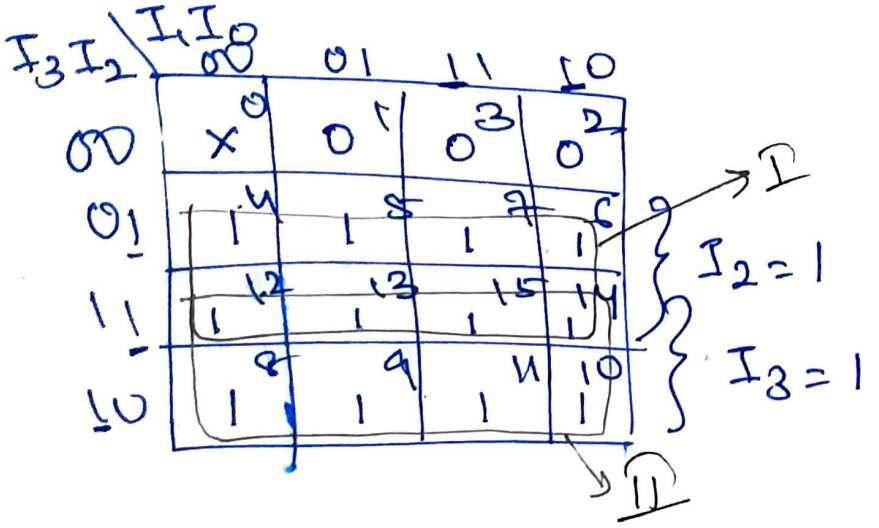
$n = 2^m$

$m = 2$.

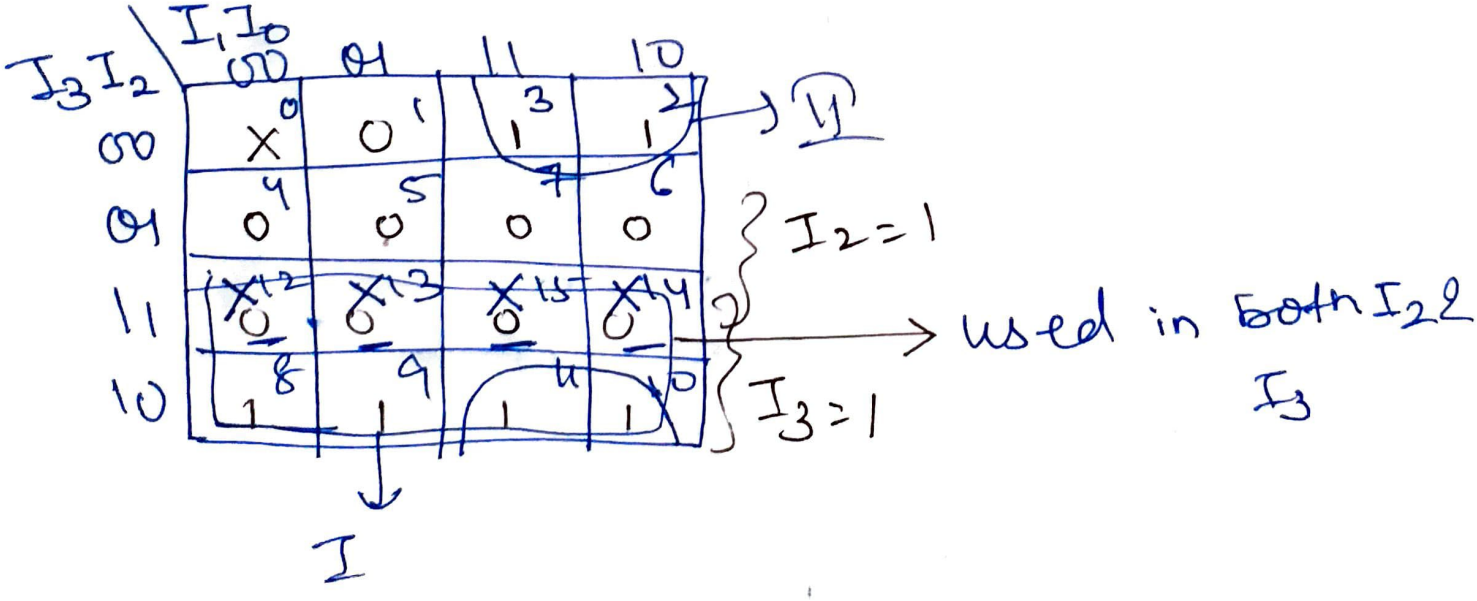
↳ $I_3 \uparrow \longrightarrow Y_1 = 1 \quad Y_2 = 1$

I_3	I_2	I_1	I_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

K-Map

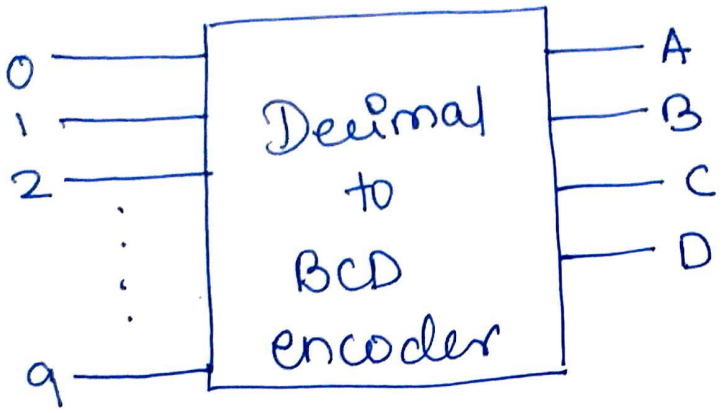


$$Y_1 = I_2 + I_3$$



$$Y_0 = I_3 + I_1 \overline{I_2}$$

Decimal to BCD



Decimal Input	BCD D	C	B	A
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

B=1 ←

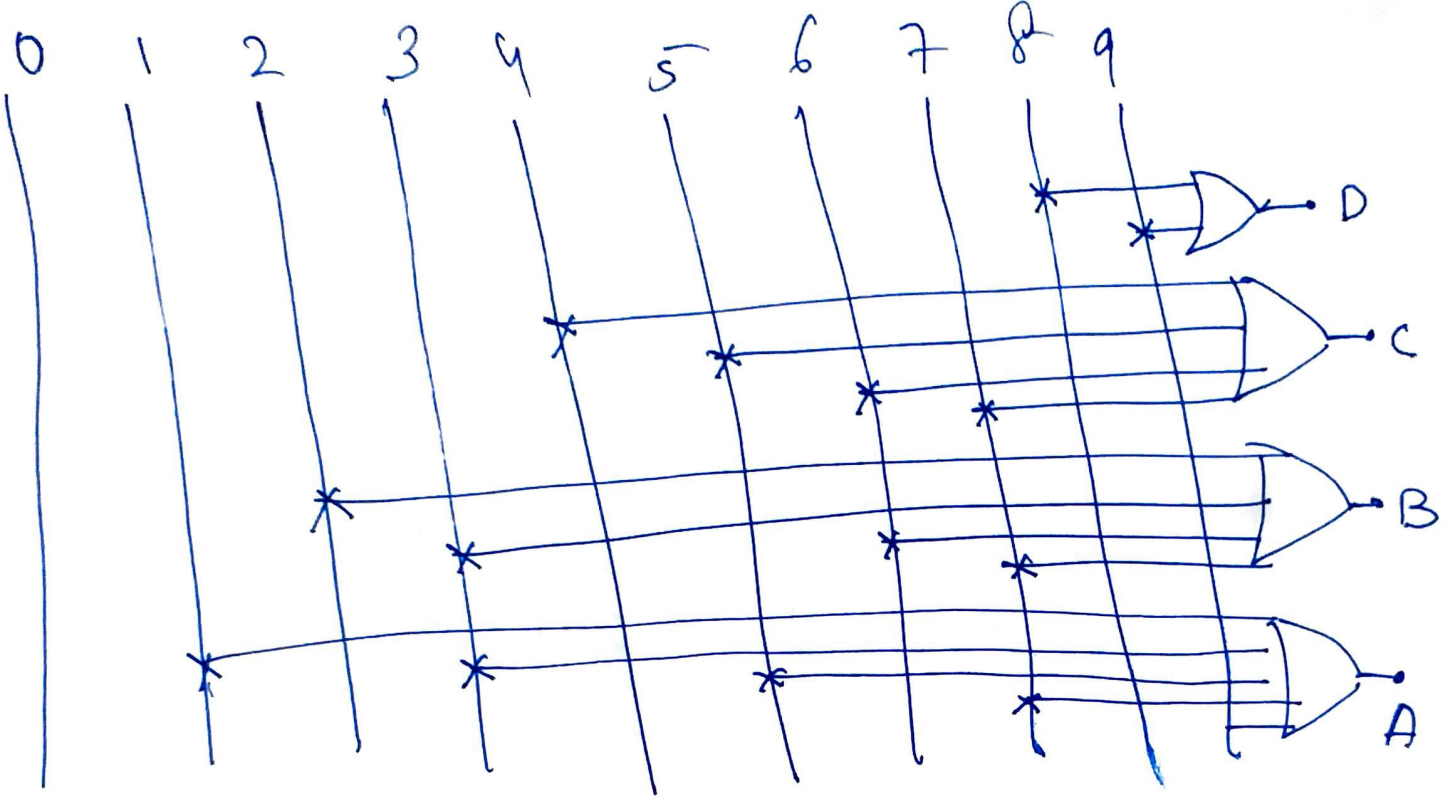
C=1

→ B = 1

D ←

$D = 8 + 9$ $\quad C = 4 + 5 + 6 + 7$

$B = 2 + 3 + 6 + 7$ $\quad A = 1 + 3 + 5 + 7 + 9$


0
1
2
3
4
5
6
7
8
9
D
C
B
A