



JYOTHISHMATHI INSTITUTE OF TECHNOLOGY AND SCIENCE

TOPIC: Code Converters

Sub: Switching Theory and Logic Design

By

Nuthi.Raju

Asst.Prof

Dept. Of ECE.

BCD to Excess-3 Code Conversion

Table 4.2

Truth Table for Code-Conversion Example

Input BCD				Output Excess-3 Code			
<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>w</i>	<i>x</i>	<i>y</i>	<i>z</i>
0	0	0	0	0	0	1	1
0	0	0	1	0	1	0	0
0	0	1	0	0	1	0	1
0	0	1	1	0	1	1	0
0	1	0	0	0	1	1	1
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	1
0	1	1	1	1	0	1	0
1	0	0	0	1	0	1	1
1	0	0	1	1	1	0	0

BCD to Excess-3 Code Conversion

		C			
		CD			
A	B	00	01	11	10
		m_0	m_1	m_3	m_2
	00	1			1
	m_4	m_5	m_7	m_6	
01	1			1	
m_{12}	m_{13}	m_{15}	m_{14}		
11	X	X	X	X	
m_8	m_9	m_{11}	m_{10}		
10	1		X	X	
		D			
		$z = D'$			

		C			
		CD			
A	B	00	01	11	10
		m_0	m_1	m_3	m_2
	00	1		1	
	m_4	m_5	m_7	m_6	
01	1		1		
m_{12}	m_{13}	m_{15}	m_{14}		
11	X	X	X	X	
m_8	m_9	m_{11}	m_{10}		
10	1		X	X	
		D			
		$y = CD + C'D'$			

		C			
		CD			
A	B	00	01	11	10
		m_0	m_1	m_3	m_2
	00		1	1	1
	m_4	m_5	m_7	m_6	
01	1				
m_{12}	m_{13}	m_{15}	m_{14}		
11	X	X	X	X	
m_8	m_9	m_{11}	m_{10}		
10		1	X	X	
		D			
		$x = B'C + B'D + BC'D'$			

		C			
		CD			
A	B	00	01	11	10
		m_0	m_1	m_3	m_2
	00				
	m_4	m_5	m_7	m_6	
01		1	1	1	
m_{12}	m_{13}	m_{15}	m_{14}		
11	X	X	X	X	
m_8	m_9	m_{11}	m_{10}		
10	1	1	X	X	
		D			
		$w = A + BC + BD$			

BCD to Excess-3 Code Conversion

◆ Simplified functions

- $x = D'$

$$z = CD + C'D'$$

$$y = B'C + B'D + BC'D'$$

$$w = A + BC + BD$$

◆ Efficient

■ implementation

$$y \quad x = CD + C'D' = CD + (C+D)'$$

$$w \quad = B'C + B'D + BC'D' = B'(C+D) + B(C+D)'$$
$$= A + BC + BD = A + B(C+D)$$

Logic Diagram for BCD to Excess-3 Code Converter

