Code Converters

→ The availability of a large variety of codes for the same discrete elements of information results in the use of different codes by different digital systems.

→ It is sometimes necessary to use the output of one system as the input to another. So a conversion circuit must be inserted between the two systems if each uses different codes for the same information.

→ Therefore a code converter is a circuit that makes the two systems compatible even though each uses a different binary code.

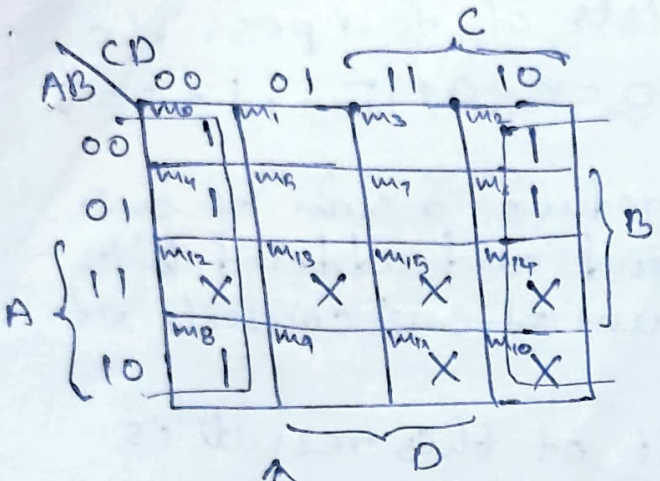
→ To convert from binary code A to binary code B, the input lines must supply the bit combination of elements as specified by code A and the output lines must generate the corresponding bit combination of code B.

→ A combinational circuit performs this transformation by means of logic gates.

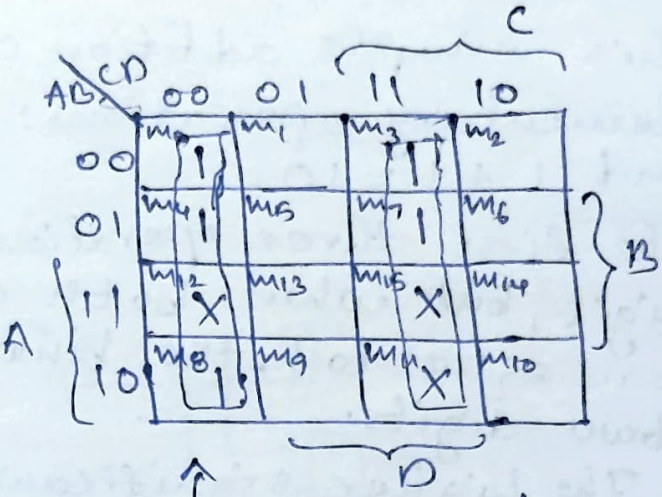
→ The design procedure for a code converter that converts binary coded decimal (BCD) to the excess-3 code for the decimal digits is as follows:

Input BCD				Output Excess-3 Code			
A	B	C	D	w	x	y	z
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

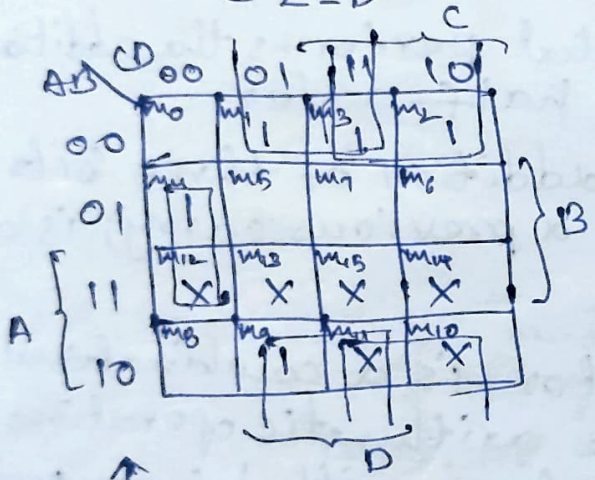
A B C D	w x y z
1 0 0 0	1 0 1 1
1 0 0 1	1 1 0 0



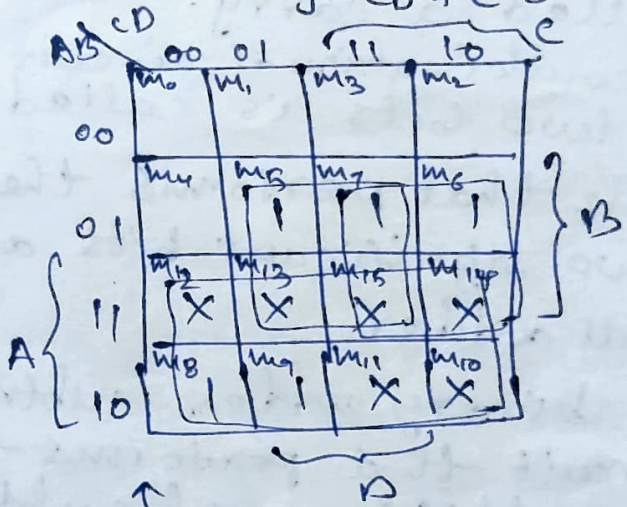
$Z = D'$



$y = CD + C'D'$



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



$w = A + BC + BD$

$Z = D'$

$y = CD + C'D' = CD + (C+D)'$

$x = B'C + B'D + BC'D' = B'(C+D)' + BC'D'$

$= B'(C+D) + B(C+D)'$

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