

Input			Output			
X	Y	Z	A	B	C	D
0	0	0	0	0	0	0
0	0	1	1	1	1	1
0	1	0	1	0	1	1
0	1	1	0	1	0	1
1	0	0	1	0	1	0
1	0	1	0	0	0	1
1	1	0	1	1	1	0
1	1	1	0	1	1	1

Solution:

$$\text{here, } A = \Sigma(1, 2, 4, 6)$$

$$B = \Sigma(1, 3, 6, 7)$$

$$C = \Sigma(1, 2, 4, 6, 7)$$

$$D = \Sigma(1, 2, 3, 5, 7)$$

K map simplifications for outputs A, B, C and D.

For A,

x\yz	00	01	11	10
0		1		1
1	1			1

$$\therefore A = x'y'z + yz' + xy$$

For B,

x\yz	00	01	11	10
0		1	1	
1			1	1

$$\therefore B = x'z + xy$$

For C,

x\yz	00	01	11	10
0		1		1
1	1		1	1

$$\therefore C = xz' + xy + yz' + x'y'z$$

For D,

x\yz	00	01	11	10
0		1	1	1
1		1	1	

$$\therefore D = z + x'y$$



No. of buffers = no. of variable
= 4 (i.e. ~~A, B, C, D~~) (x, y, z)

No. of programmable AND gate
= no. of min terms
= 6

No. of fixed OR gate
= no. of output functions
= 4 (i.e. (A, B, C, D)')

