

a)



Dec. Digit	LED	INPUT				OUTPUT						
		$x_3$	$x_2$	$x_1$	$x_0$	a	b	c	d	e	f	g
0		0	0	0	0	0	0	0	0	0	0	1
1		0	0	0	1	1	0	0	1	1	1	1
2		0	0	1	0	0	0	1	0	0	1	0
3		0	0	1	1	0	0	0	0	1	1	0
4		0	1	0	0	1	0	0	1	1	0	0
5		0	1	0	1	0	1	0	0	1	0	0
6		0	1	1	0	0	1	0	0	0	0	0
7		0	1	1	1	0	0	0	1	1	1	1
8		1	0	0	0	0	0	0	0	0	0	0
9		1	0	0	1	0	0	0	1	1	0	0
10		1	0	1	0	0	0	0	1	0	0	0
11		1	0	1	1	1	1	0	0	0	0	0
12		1	1	0	0	0	1	1	0	0	0	1
13		1	1	0	1	1	0	0	0	0	1	0
14		1	1	1	0	0	1	1	0	0	0	0
15		1	1	1	1	1	0	1	1	0	0	0

b)

$x_3$	$x_2$	$x_1$	$x_0$	
00	01	11	10	
00	0	1	0	0
01	1	0	0	0
11	0	1	0	0
10	0	0	1	0

$x_3$	$x_2$	$x_1$	$x_0$	
00	01	11	10	
00	0	1	0	0
01	0	1	0	1
11	1	0	1	1
10	0	0	1	0

c)

$x_3$	$x_2$	$x_1$	$x_0$	
00	01	11	10	
00	0	0	0	1
01	0	0	0	0
11	1	0	1	1
10	0	0	0	0

d)

$x_3$	$x_2$	$x_1$	$x_0$	
00	01	11	10	
00	0	1	0	0
01	1	0	1	0
11	0	0	1	0
10	0	0	0	1



c

$x_2 x_3$	00	01	11	10
$x_0 x_1$				
00	0	1	1	0
01	1	1	1	0
11	0	0	0	0
10	0	1	0	0

f

$x_2 x_3$	00	01	11	10
$x_0 x_1$				
00	0	1	1	1
01	0	0	1	0
11	0	1	0	0
10	0	0	0	0

g

$x_2 x_3$	00	01	11	10
$x_0 x_1$				
00	1	1	0	0
01	0	0	0	0
11	1	0	0	0
10	0	0	0	0

h

$x_2 x_3$	00	01	11	10
$x_0 x_1$				
00				
01				
11				
10				

i

$x_2 x_3$	00	01	11	10
$x_0 x_1$				
00				
01				
11				
10				

$$a = \bar{x}_3 \bar{x}_2 \bar{x}_1 x_0 + \bar{x}_3 x_2 \bar{x}_1 \bar{x}_0 + x_3 \bar{x}_2 x_1 x_0 + x_3 x_2 \bar{x}_1 x_0$$

$$b = x_3 \bar{x}_2 \bar{x}_0 + \bar{x}_3 x_1 x_0 + x_2 x_3 x_0 + x_2 x_1 y_0$$

$$c = x_0 \bar{x}_1 x_2 \bar{x}_3 + x_2 x_1 x_0 + x_1 x_2 \bar{x}_3$$

$$d = x_3 \bar{x}_2 \bar{x}_1 \bar{x}_0 + \bar{x}_3 \bar{x}_2 x_1 \bar{x}_0 + \bar{x}_3 x_2 \bar{x}_1 x_0 + x_3 x_2 x_1$$

$$e = x_3 \bar{x}_0 + \bar{x}_1 x_3 \bar{x}_2 + x_1 \bar{x}_0 \bar{x}_2$$

$$g = \bar{x}_3 \bar{x}_2 x_1 x_0 + \bar{x}_2 \bar{x}_1 \bar{x}_0$$

$$f = x_3 \bar{x}_2 x_1 x_0 + x_3 \bar{x}_1 \bar{x}_0 + x_2 x_1 x_0 + x_0 x_3 x_2$$