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CSE 3100-01/02

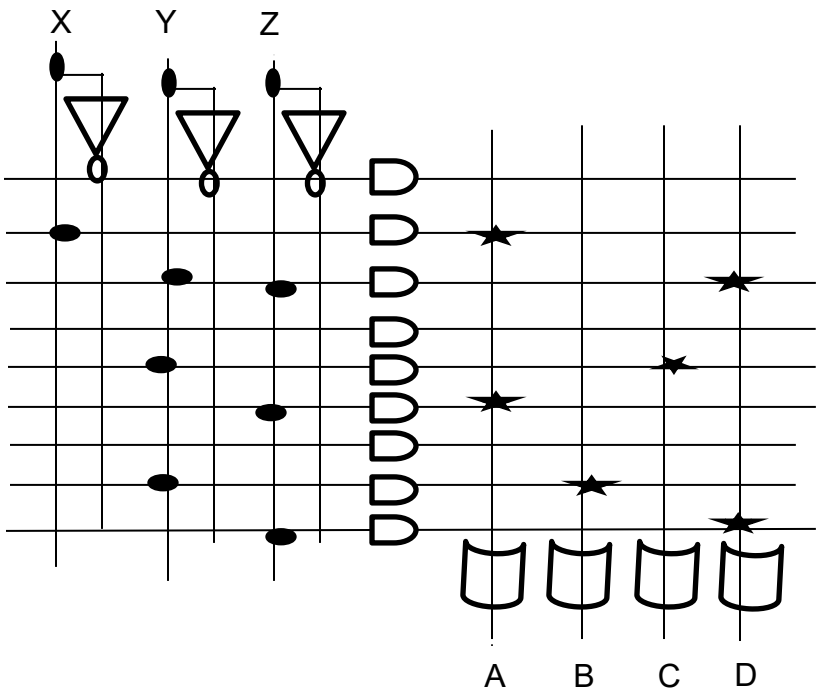
Question one

A (x, y, z) = ∑ (1, 2, 4, 6)
B (x, y, z) = ∑ (0, 1, 6, 7)
C (x, y, z) = ∑ (2, 6)
D (x, y, z) = ∑ (1, 2, 3, 5, 7)

Programming table

Products terms	AND Inputs				Outputs
	X	Y	Z	D	
1	1	-	-	-	w = A+BC+BD
2	-	1	1	-	
3	-	1	-	1	
4	-	0	1		x = B′C + B′D + BC′D′
5	-	0		1	
6	-	1	0	0	
7	-		1	1	y = CD + C′D′
8	-	-	0	0	
9	-	-	-	-	
10	-	-	-	0	z = D′
11				-	
12	-	-	-	-	

Circuit diagram



Question Two

a)

X	Y	Z		A	B	C
0	0	0		0	1	0
0	0	1		0	1	1
0	1	0		1	0	0
0	1	1		1	0	1
1	0	0		0	0	1
1	0	1		0	1	0
1	1	0		0	1	1
1	1	1		1	0	0

b)

x\yz	00	01	11	10
0		1	1	

Y z					
	1				1

C = x' z + x z'
C=x+z

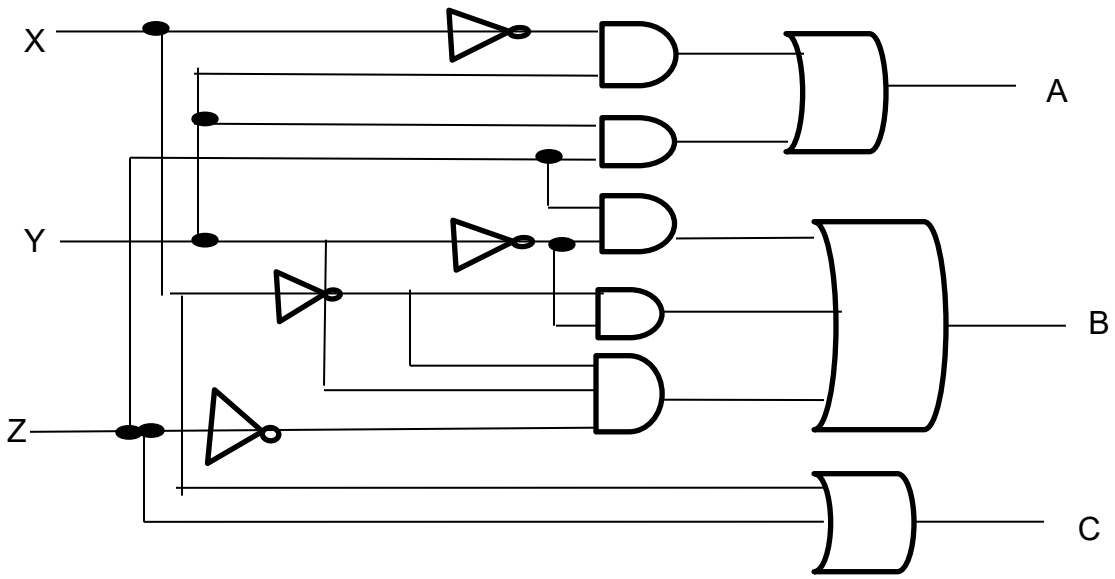
x

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

B = y' z + x' y' + x y z'

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

A = x' y + y z

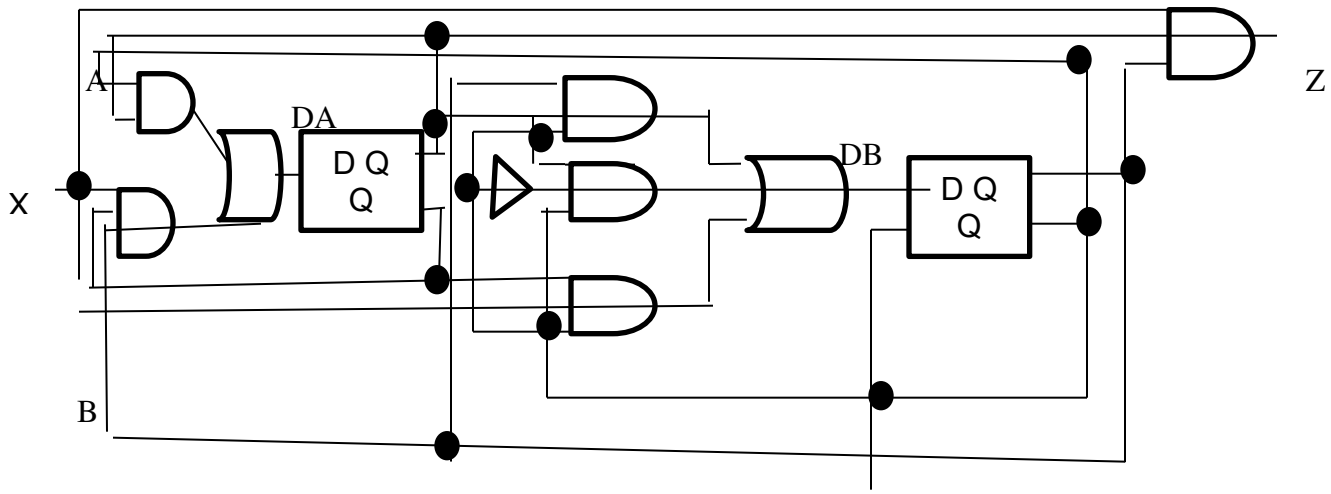


Question Three

(a).

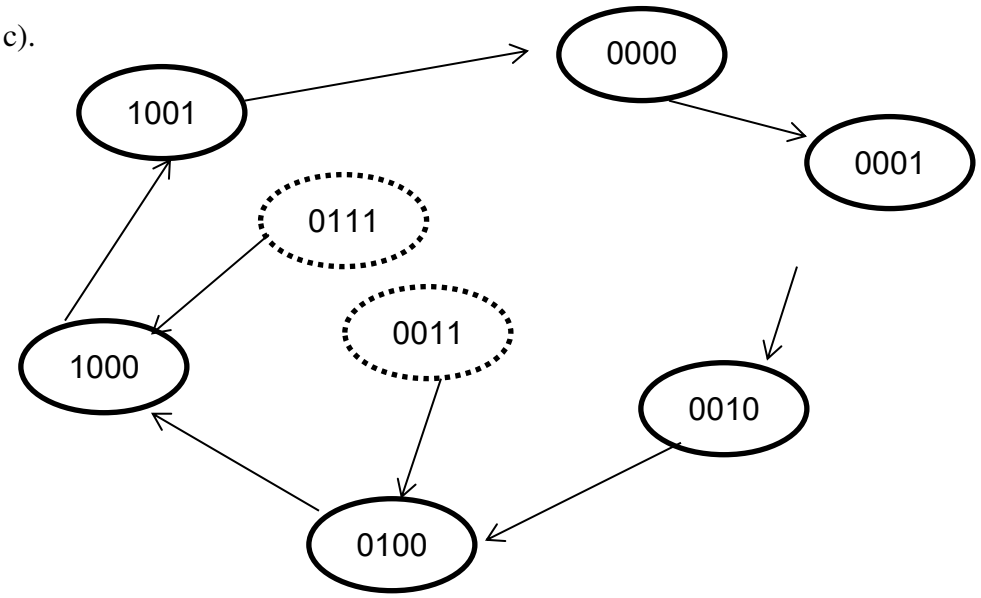
Present state				Next state				Y
Q4	Q3	Q2	Q1	$D_4=Q_4(t+1)$	$D_3=Q_3(t+1)$	$D_2=Q_2(t+1)$	$D_1=Q_1(t+1)$	0
0	0	0	0	0	0	0	1	0
0	0	0	1	0	0	1	0	0
0	0	1	0	0	0	1	1	0
0	0	1	1	0	1	0	0	0
0	1	0	0	0	1	0	1	0
0	1	0	1	0	1	1	0	0
0	1	1	0	0	1	1	1	0
0	1	1	1	1	0	0	0	0
1	0	0	0	1	0	0	1	0
1	0	0	1	0	0	0	0	1

(b).



CLK

c).



d). Yes, it is self-correcting because it is able to transit from invalid state to next valid state after a finite number of transitions