CMPE 321

Computer Arch.

QUIZ 2 B

1) Choose one of the following questions and only answer it. (20 Points)

a) Show the steps of 2's complement rule 01010101.

b) Create MUX structure with any gates you want. Try to avoid excess.

c) What is the positive edge D flip flop? And what are the differences beetween positive edge and active low D flip flop?

Answer: 1.b) Create MUX structure

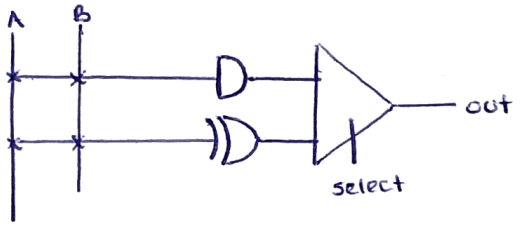
A	B	Sum	CARRY
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

→ A.B

→ A⊕B

if select out sum

else out carry



1.a) $(01010101)'$

$10101010 + 1$

Answer: 10101011

2) According to given state diagram:

a) Create the state table. (Present / Next State) (20 Points)

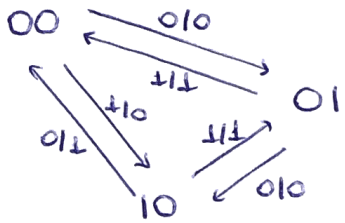
b) Draw the K-MAP. (20 Points)

c) Implement the circuit. (20 Points)

Answer: 2. a)

a)

present states		input	next states		output
A	B	X	A'	B'	Y
0	0	0	0	1	0
0	0	1	1	0	0
0	1	0	1	0	0
0	1	1	0	0	1
1	0	0	0	0	1
1	0	1	0	1	1
1	1	0	1	1	1
1	1	1	1	1	1



b)

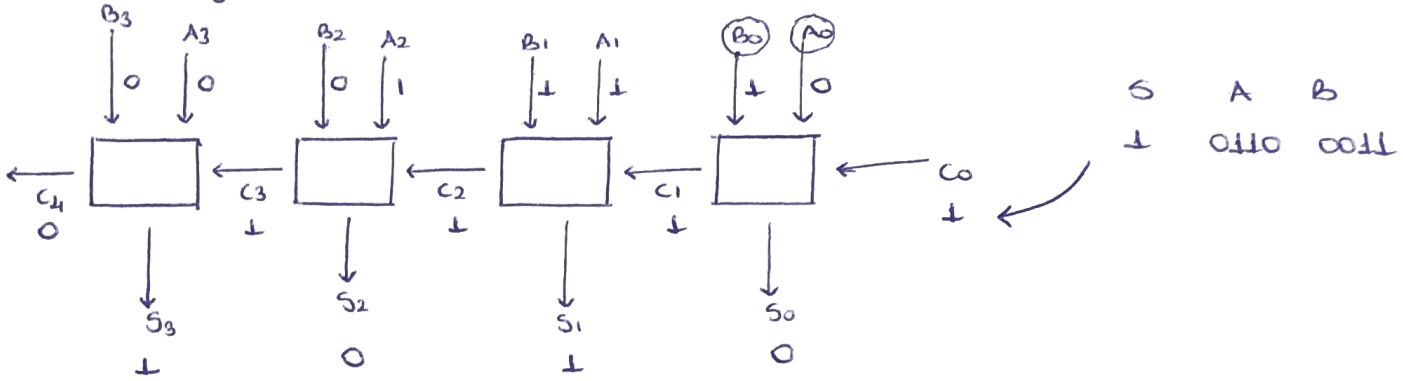
A \ BX	00	01	11	10
0	0	0	1	0
1	1	1	1	1

$Y = A + BX$

c) for A', B' and X, draw D flip flops.

for Y, draw as output.

3) According the 4 Bit Adder shape given below, calculate the addition of given two numbers. Please give the result of C_4, S_3, S_2, S_1, S_0.



$C_4 = 0$, $S_3 = 1$, $S_2 = 0$, $S_1 = 1$ and $S_0 = 0$

S_0, A = 6 , B = 3 , A + B = 9
(0110) (0011) (1010)