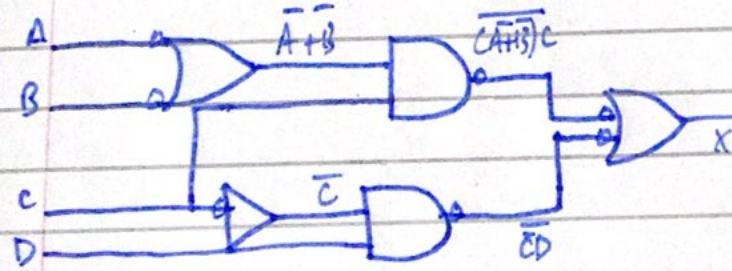
ID# 13794 26/09/20

Digital Logic Design

Final Paper

Q1) Draw the logic circuit using the input (A, B, C, D) and output (x) waveforms in

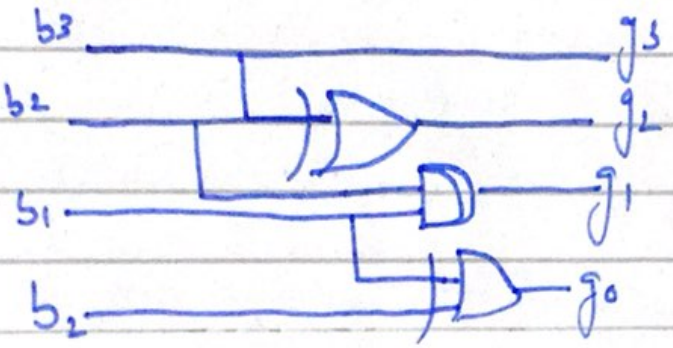
Sol: The output expression for the circuit y developed in figure. The SOP form indicates that the output is High when A is Low and C is HIGH or when B is Low & C is HIGH or when C is Low or D is HIGH



$x = \overline{(\overline{A+B})C + \overline{C}D} = (\overline{A+B})C + \overline{C}D = \overline{A}C + \overline{B}C + \overline{C}D$

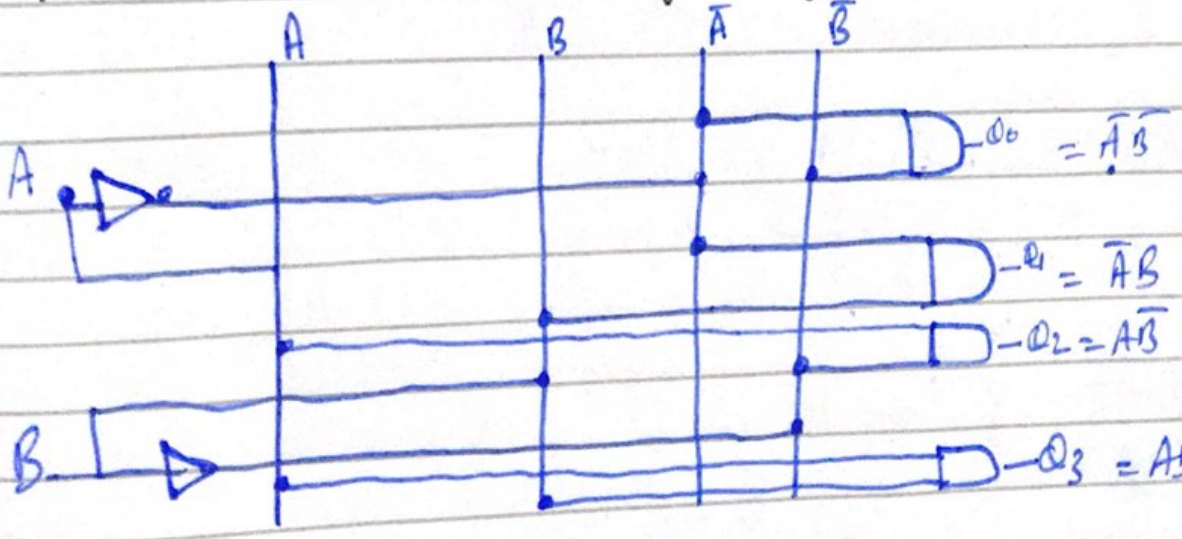
Q5) Show the logic required to convert a 4-bit Gray code to binary and use that logic to convert the following Gray code words to binary: 1011

Ans: The conversion of binary to gray code can be done by using a logic circuit The gray code is a non weighted code because there is no particular weight is assigned for the position of the bit.



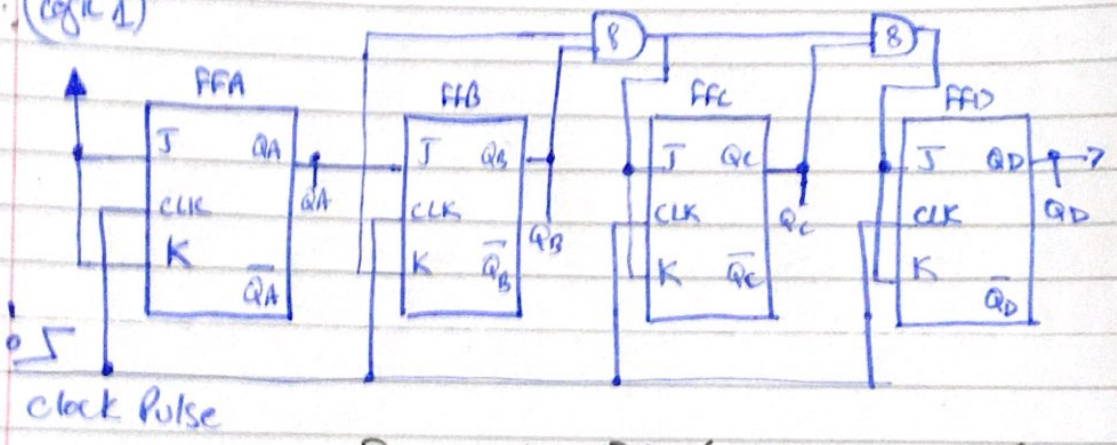
Q6) Draw & explain the lgic diagram ?

Ans:



Q4) Draw the logic diagram and timing diagram for the 4-Stage synchronous binary counter. Verify that the waveforms of the Q outputs represents the proper binary number after each clock pulse.

Sol: (CO/K 1)



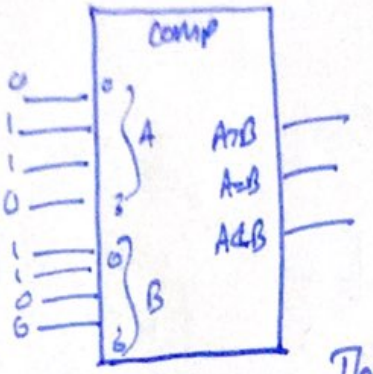
Binay 4-Bit Synchronoy Up Counter

Q4) Determine the A=B, A>B, and A<B outputs for the input numbers shown on the comparator in figure.

Ans:

(4)

Ans:



The number on the A input is 0110 and the number on the B input is 0011. The A>B output is HIGH & the other outputs are low.

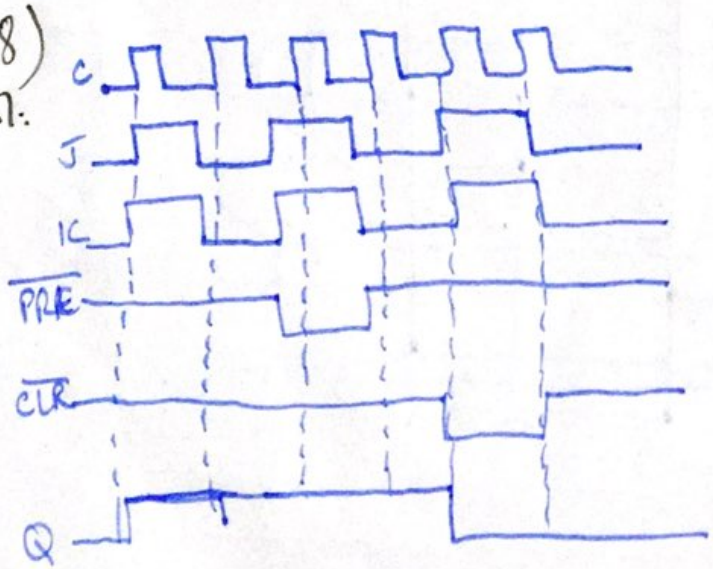
Q2)

Sol:

Select		Data Input	Output
S1		S0	Y
0		0	D0
0		1	D1
1		0	D2
1		1	D3

Q8)

Sol:



Q7)

Ans: JK-Flip Flop: The flip flop is a basic building block of sequential logic circuits. It is a circuit that has two stable states & can store one bit of state info. The output changes state by signals applied to one or more control inputs.

The basic JK flip flop has J.K inputs & a clock input & outputs Q & $\overline{Q}$ (The inverse of Q) optionally it may also include the $\overline{PR}$ & $\overline{CLR}$ control inputs.

Frequency Divider: