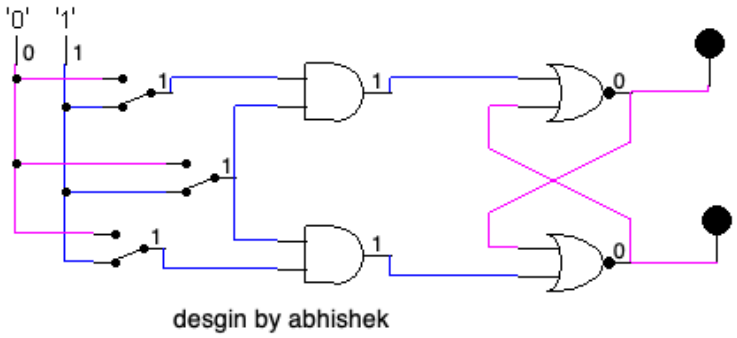
Instruction:

Complete all questions in 1 hour.

1. What is flip flop? Describe the working mechanism RS flip flop.

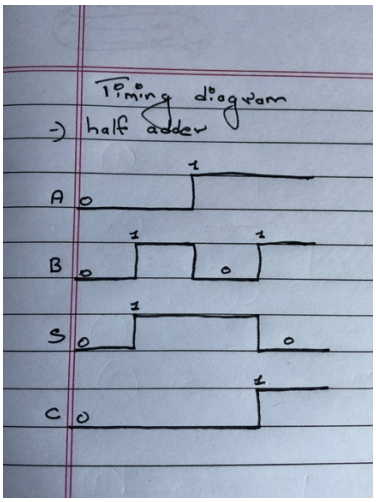
» It is a device which stores a single bit of data one of its two states represent a 1 and other represent a 0

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

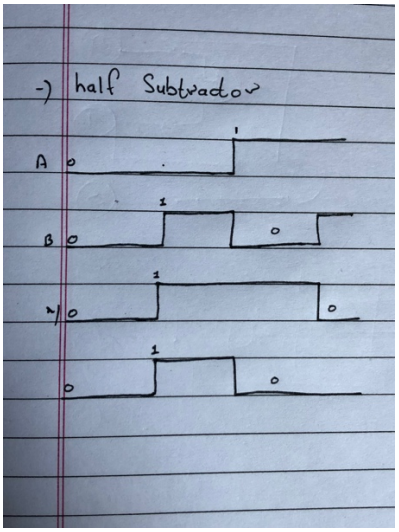


2. Construct the timing diagram for half adder and half subtractor, full adder.

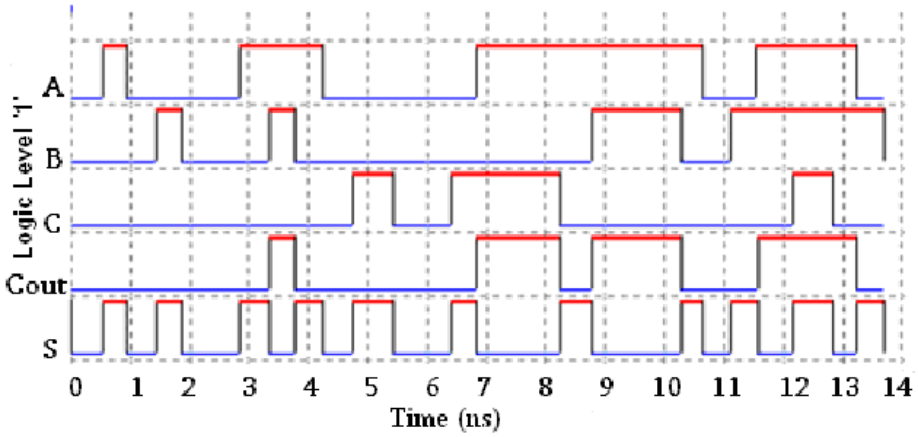
= Half adder



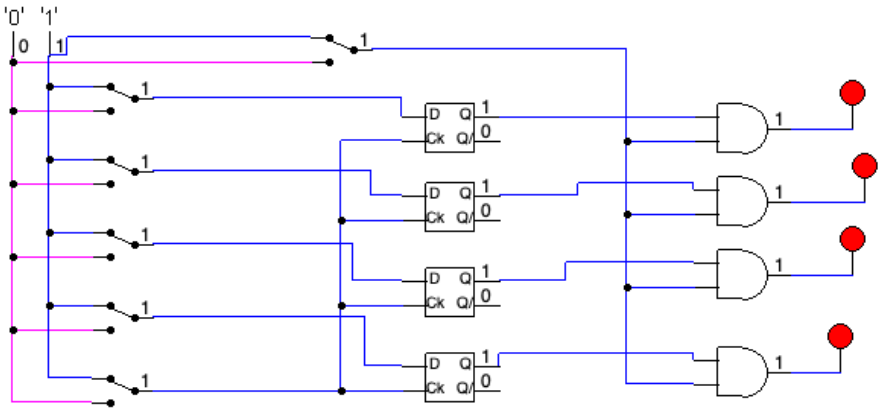
Half subtractor



Full adder



3. Describe the working mechanism of 4-bit register by constructing the circuit using D flip flop.



4. Differentiate between:

a) Flip flop and Latch

Flip	Latch
Building blocks of sequential circuit, built using latches	Building blocks of sequential circuit, built using logic gates
Works with binary inputs as well as the clock signal	Works with only binary inputs
Has a clock signal	No clock signal

b) Combinational circuit and Sequential circuit

Combinational	Sequential
It is a type of circuit that generates an output by relying on the input it receives at that instant, and it stays independent of time.	It is a type of circuit in which the output does not only rely on the current input. It also relies on the previous ones.
Logic gates form the building/ elementary blocks of a Combinational Circuit.	Flip-flops form the building/ elementary blocks of a Sequential Circuit.
One can use these types of circuits for both- Boolean as well as Arithmetic operations.	You can mainly make use of these types of circuits for storing data.

c) SIPO and PISO shift register

SIPO	PISO
It shifts data into internal storage elements and shifts data out at the serial-out, data-out, pin.	It registers stores data, shifts it on a clock-by-clock basis, and delays it by the number of stages times the clock period.
It is different in that it makes all the internal stages available as outputs.	All internal stages are not available as outputs.