HW-4

IE590 Information Engineering

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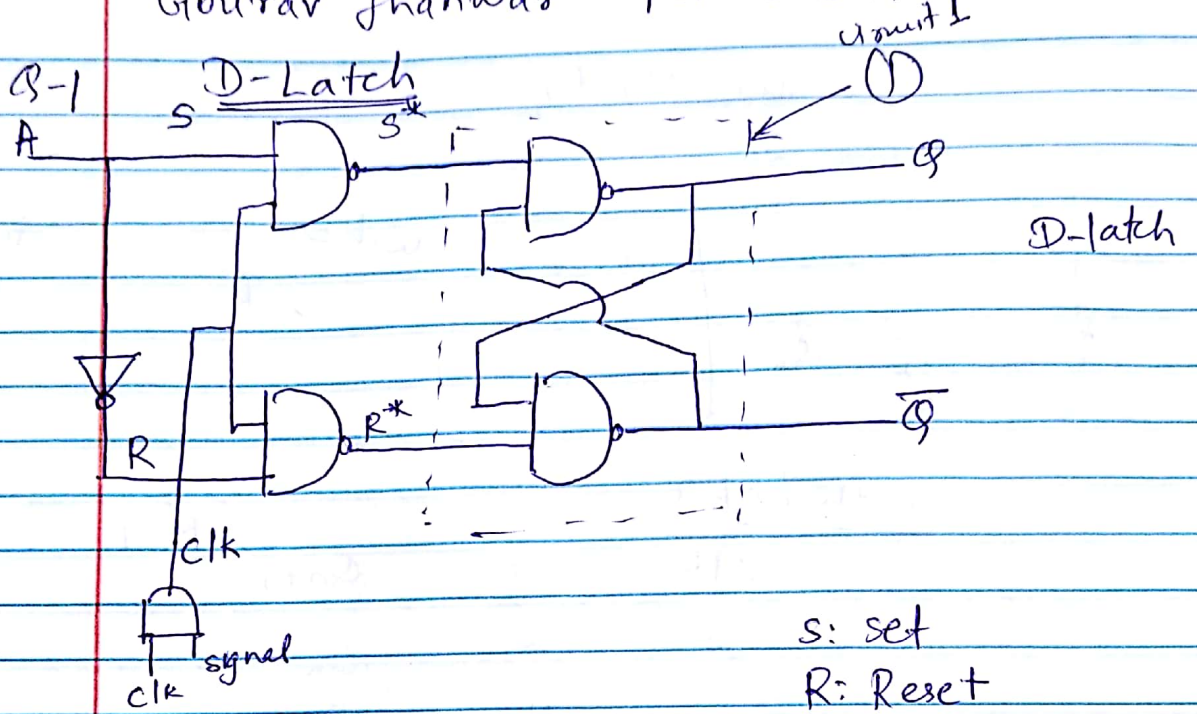
Q-1



S: set

R: Reset

From above diagram,

$$S^* = (S \cdot clk)' = S' + clk'$$

$$\& \; R^* = (R \cdot clk) = R' + clk'$$

Let us evaluate circuit 1 without clock

S^*	R^*	Q	$\bar{Q}$
0	0	Not used	
0	1	1	0
1	0	0	1
1	1	Memory of previous state	

Table 1

Now, let us evaluate S^* & R^* when clock turns 0 & 1 without not gate in the beginning.

when clock = 1

$S^* = S'$

$R^* = R'$

when clock = 0

$S^* = 1$

$R^* = 1$

since in NAND gate, when any input is 0, output is 1 always

let us check Q & $\bar{Q}$ w.r.t S & R with clock

	Clock	S	R	Q	$\bar{Q}$	from table ①
	0	*	*	Memory of previous		
$S^*=1$ $R^*=1$	⇐ 1	0	0	Memory of previous		
		0	1	0	1	
$S^*=1$ $R^*=0$	⇐ 1					
	1	1	0	1	0	
	1	1	1	Not used		

Characteristics table

clock	S	R	Q(1)
0	*	*	Q(0)
1	0	0	Q(0)
1	0	1	0
1	1	0	1
1	1	1	Not used

Now, when NOT gate is put in between S & R & single input is given;

Truth table

clk	A	Q(1)
0	*	Q(0)
1	0	0
1	1	1

(Q-2) Write an assembly language program to multiply two numbers:

soln:-

	Operatn			
D	+	0	0	C
E	if	B	I	F
F	a +	C	A	C
G	-	B	I	B
H	go to	E		
I	END			

∴ Final output is stored in C.

(Q-3) Write an assembly language program to divide two numbers.

→ soln:-

	Operation			
F	+	0	0	C
G	-	A	B	A
H	+	C	I	C
I	comp	A	I	D
J	if	D	G	K
K	comp	A	-I	E
L	If	E	N	M
M	-	C	I	
N	END			

∴ Final quotient is stored in C.