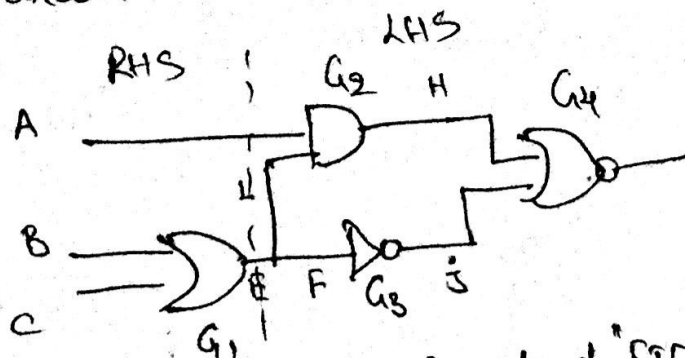


Logic Levelization:-

Steps:-

- ① Assign "level-0" to all Primary i/p (PI) of circuit (e.g. $ABC = 000$)
- ② Put all Primary i/p of fanout base gates to Queue (FIFO Principle). 'Q'.
- ③ Declaration of gates in Queue as front (left hand side); back (RHS)

④



- ⑤ First i/p is 'A' so from principle of "FIFO" the circuit left side gates are G_2 & G_3 where Right hand side G_1
- ⑥ To pop gate from 'Q' the operation depends on i/p of circuit first so as G_2 is having first i/p "A" and next i/p drives G_1 gates "B & C"
- ⑦ Only time we pop at gate from the Queue if G_2 is not ready for levelization then we put G_2 back. ~~and~~ \rightarrow (append gate to Q).

- ⑧ Next gate G_1 is ready for levelization then follows two steps.

step 1:-

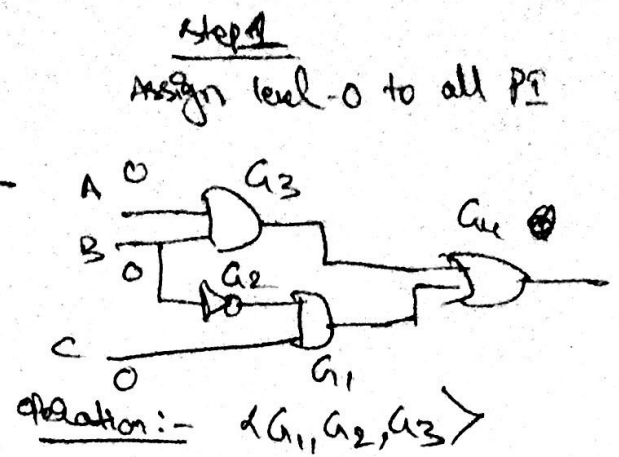
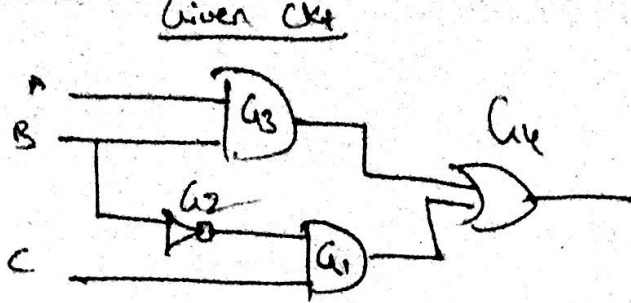
l = indicates max of gates driving gate levels (level - 1)

step 2:-

assign $l+1$ to gates (level - 2)

⑨

After levelization of gate is done (e.g. G_1) then we append gates fanout gates to 'Q' operation.



Step - 2

(Front) LHS ; Back (RHS)

\downarrow
 $\langle G_1, G_2 \rangle ; G_3$

This operation is done based on driving of i/p's.

Step - 3 :- Put all fanout gates to Queue(Q) FIFO Principle

Here fanout gates are G_2 & G_3 so the operation is

$\langle G_2, G_3, G_1 \rangle$

Step - 4 :- Pop ~~next~~ next gate 'g' from 'Q'.

on Pop operation of next gate to Queue we level up the previous gate.

ie from Step-3 G_2 is Popped and sequence $\langle G_3, G_1, G_1 \rangle$

\downarrow
appended gate to Pop next gate from 'Q'.

So here $G_2 \rightarrow$ is level up. as '1'

Step:-5

again repeat Pop operation from Step '4' so finally G_2 is appended and o/p sequence is $\langle G_1, G_1, G_4 \rangle$ with $G_2 = 1 ; G_3 = 1$.

Step 6:-

As of Step: 5 sequence $\langle G_1, G_1, G_4 \rangle$ on Pop operation the fanout i/p of G_1 is to be appended by defining max no. of i/p by '+1'. so the $G_1 = 2$ and $G_2 = 1 ; G_3 = 1$. and o/p sequence is

$\langle G_1, G_2, G_4 \rangle$.

Step 7:- Repeats o/p sequence $G_1 = 2 ; G_2 = 1 ; G_3 = 1$ & o/p $\langle G_2, G_2, G_4 \rangle$