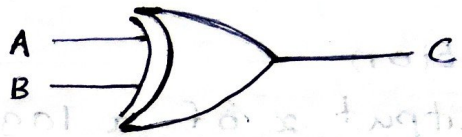
Tutorial A 03

(01) A balb in a staircase has two switches one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and can be turned OFF by and one of the switches respective of the state of the other switch.

(a) Draw the truth table for above situation

(b) Draw the most suitable logic circuit.

A	B	Output
0	0	0
0	1	1
1	0	1
1	1	0

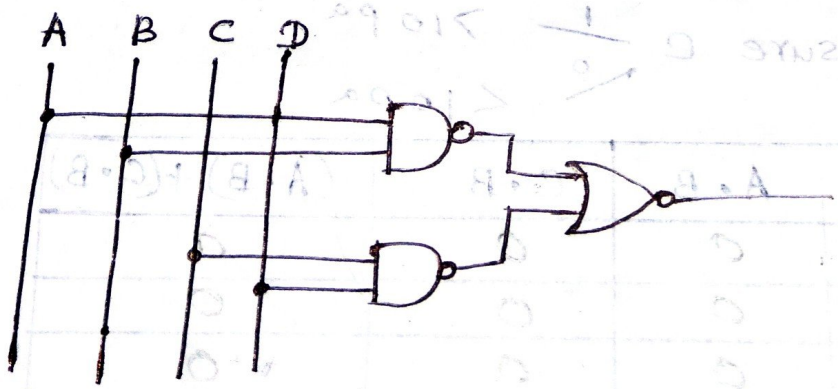


(02) The boolean function $Y = AB + CD$ is to realized using only 2 input NAND Gate.

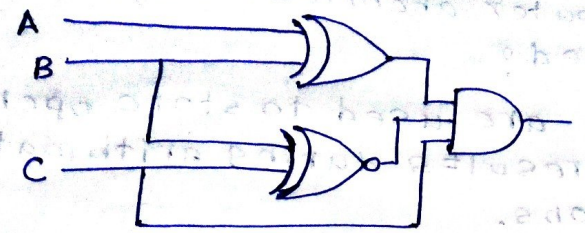
(a) Extract the boolean function for NAND gate using the above formula.

$$Y = A.B + C.D$$

$$Y = \overline{\overline{AB} + \overline{CD}}$$



(c 3) What is the boolean expression for the given logical circuit below.



$x = (A \oplus B) \cdot (\overline{B \oplus C}) \cdot C$

(04)

A	B	C	D	output
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

$\bar{A} \cdot \bar{B} \cdot \bar{C} \cdot D$

$\bar{A} \cdot B \cdot \bar{C} \cdot D$

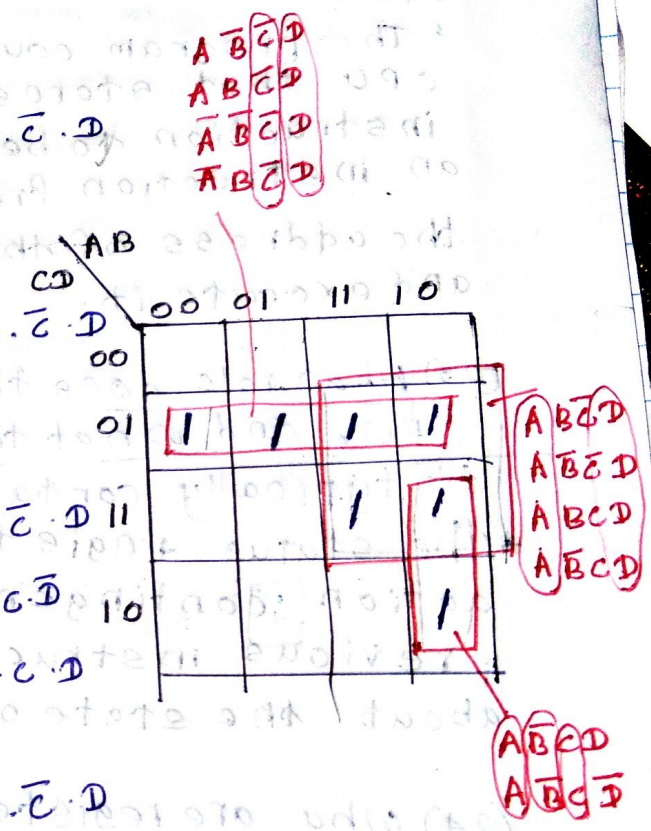
$A \cdot \bar{B} \cdot \bar{C} \cdot D$

$A \cdot \bar{B} \cdot C \cdot \bar{D}$

$A \cdot \bar{B} \cdot C \cdot D$

$A \cdot B \cdot \bar{C} \cdot D$

$A \cdot B \cdot C \cdot D$



$F = (\bar{C}D) + (A \cdot D) + (A \cdot \bar{B} \cdot C)$

$F_{ON} = (\bar{A} \cdot \bar{B} \cdot \bar{C} \cdot D) + (\bar{A} B \bar{C} D) + (A \bar{B} \cdot \bar{C} D) + (A \bar{B} \bar{C} D) + (A \bar{B} C D) + (A B \bar{C} D) + (A B C D)$