13-08-17

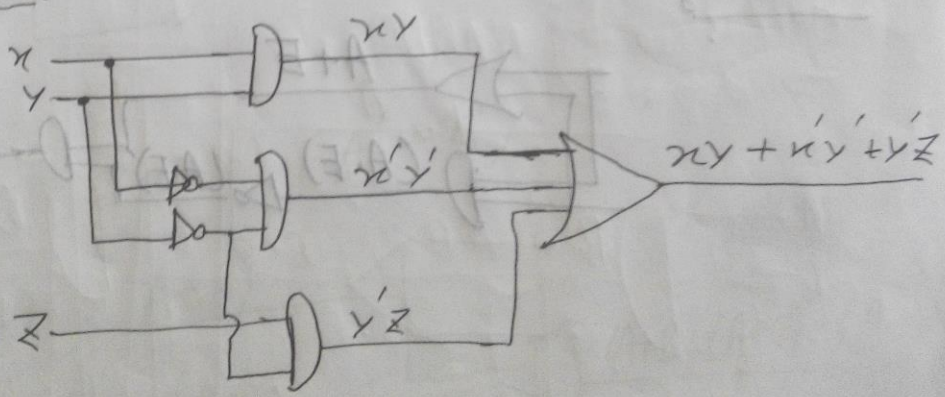
* Given the boolean function $F = xy + x'y' + y'z$

(i) Implement it with AND, OR and NOT Gate.

(ii) Implement it with only OR and NOT gate.

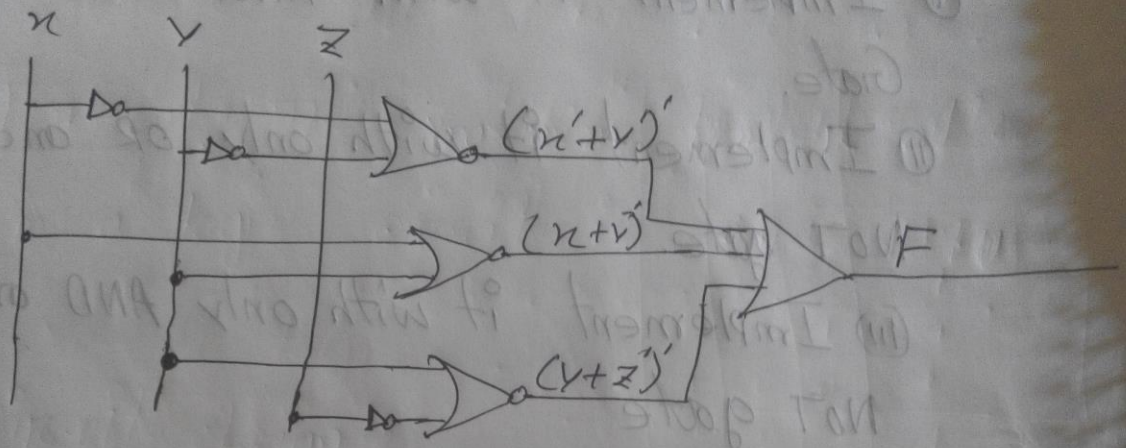
(iii) Implement it with only AND and NOT gate

(i) Answer:-

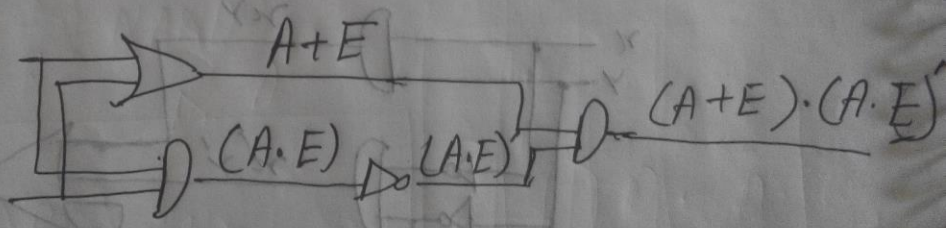


(11) Answer:- $F = xy + x'y' + y'z$

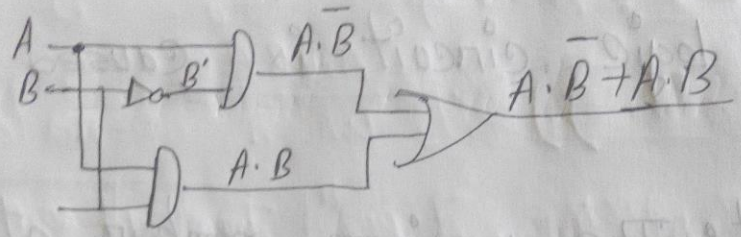
$= (x'+y')' + (x+y)' + (y+z')'$



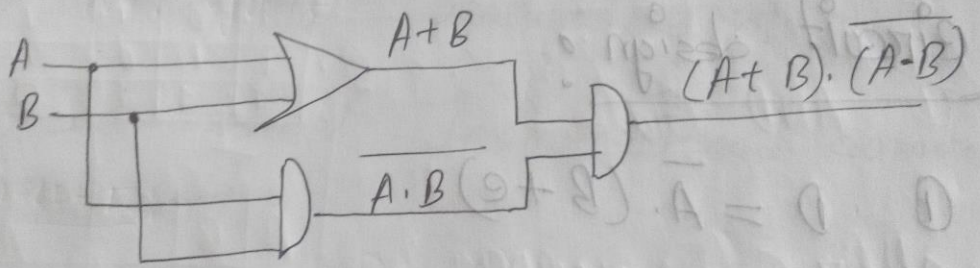
Test:



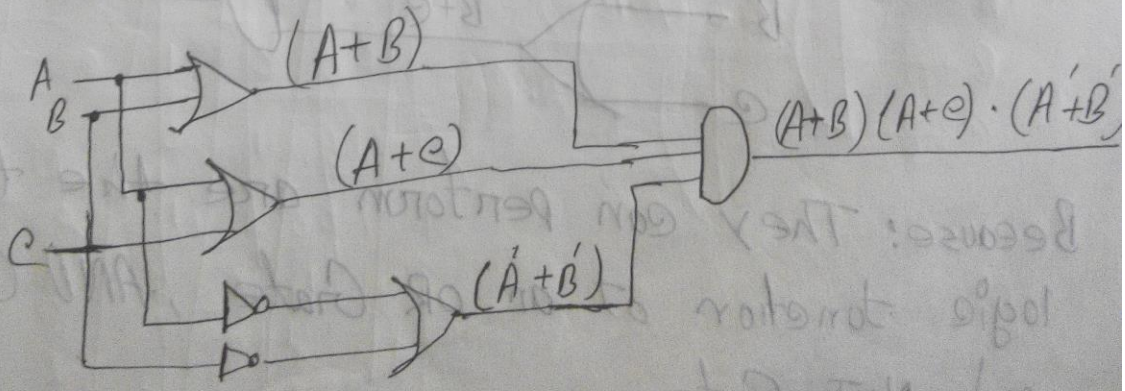
i) $A \cdot \bar{B} + A \cdot B$



ii) $(A+B) \cdot \overline{(A \cdot B)}$



iii) $(A+B) \cdot (A+C) \cdot (A'+B')$

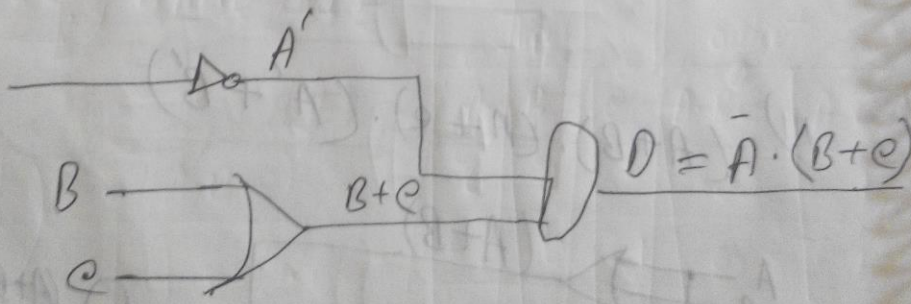


Fan-in: The maximum number of input in a logic circuit is caused Fan-in.

Fan-out: The maximum number of output in a logic circuit is caused Fan-out.

Circuit design:

① $D = \bar{A} \cdot (B + C)$



Because: They can perform are the three logic function of an OR Gate, AND Gate and NOT Gate.

Application of logic Gate:

(i) To build more complex divece like binary counter.

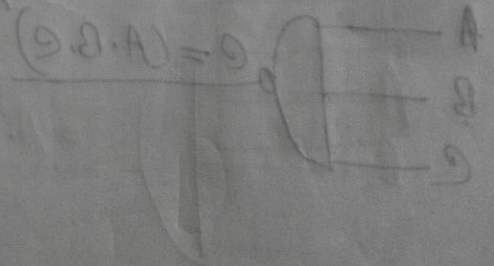
(ii) In calculators an computers.

(iii) In digital meagering teanie.

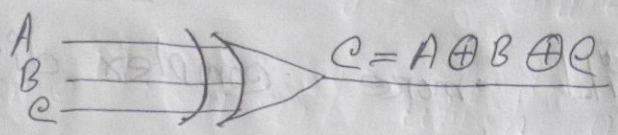
(iv) In digital processing of commication

v) In musical Instroment and domestic element.

1	0	0	0	0
1	0	1	0	0
1	0	0	1	0
1	0	1	1	0
1	0	0	0	1
1	0	1	0	1
1	0	0	1	1

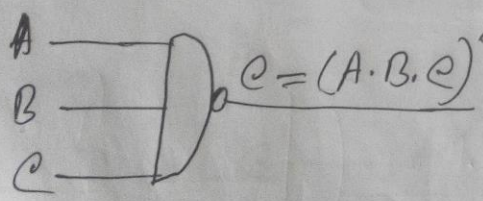


X-OR :



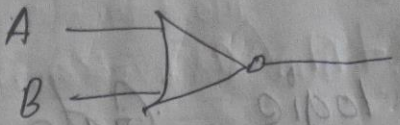
Input			output
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

other Gate : NAND Gate



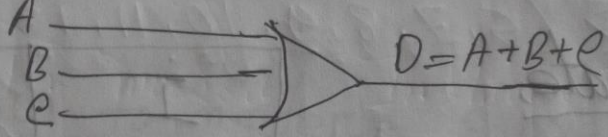
Input			output	
A	B	C	A·BC	$\overline{A \cdot BC}$
0	0	0	0	1
0	0	1	0	1
0	1	0	0	1
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	1	0

NOR:

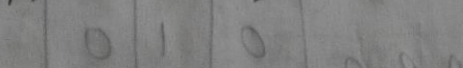


NAND and NOR Gates are called Universa
Gate. Basic Gate A.

OR Gate:



NOT Gate:

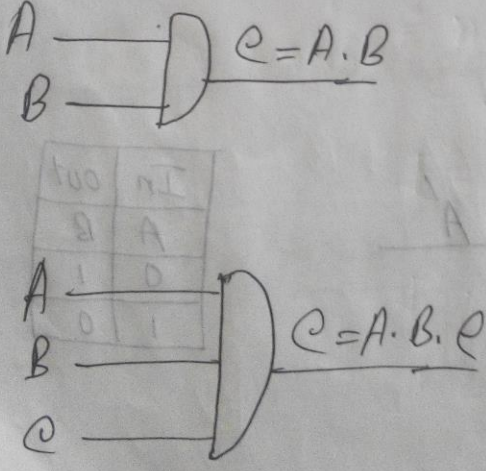


In	out
A	B
0	1
1	0

logic Gate: A logic Gate is an electronic circuit which operates on one or more Input signal signal to produce standard output signal.

Type of logic circuit:

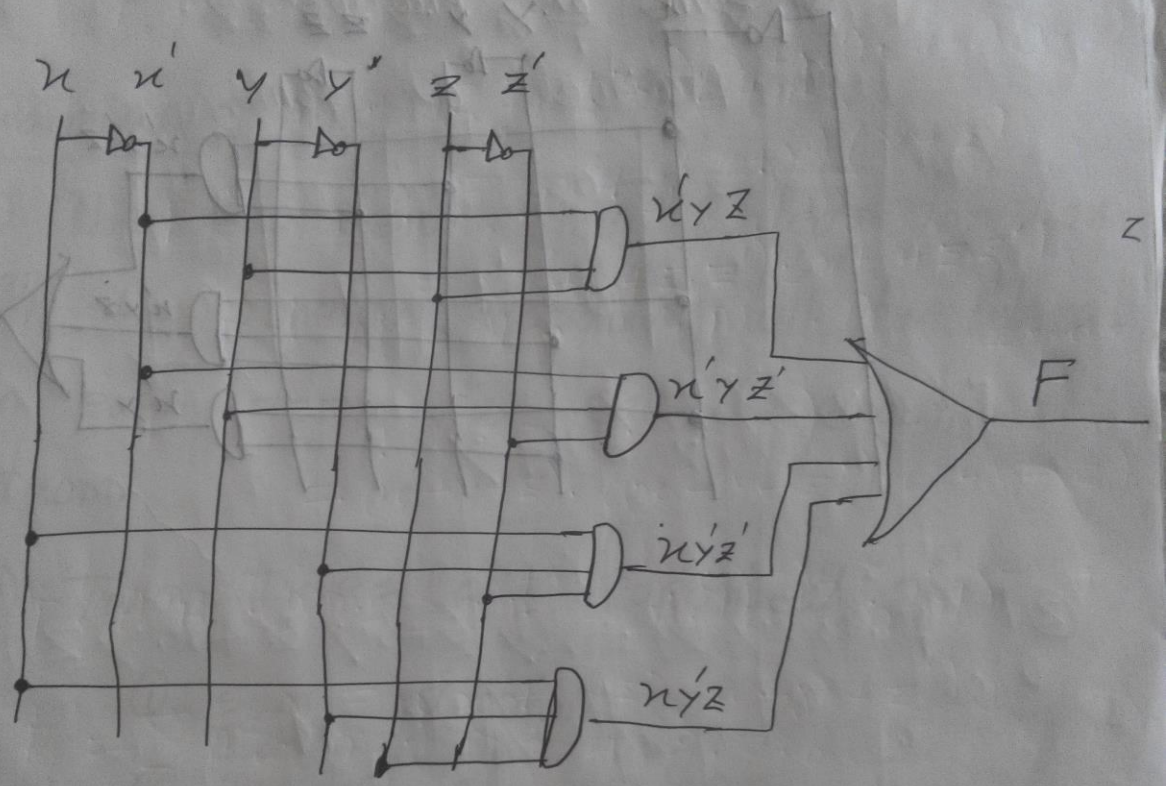
① **AND Gate,**



I			O
A	B	C	A.B.C
0	0	0	0
0	0	1	0
0	1	0	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Draw the circuit :

① $x'yz + x'yz' + xy'z' + xy'z$



* Find out the Boolean expression,