EXPERIMENT- 2
SOP AND POS FORMS

Aim:-Implement of the given Boolean function using logic gates in both SOP and POS forms
Two input SOP - A.B + A'.B'
Two input POS: - (A+B) (B+C) (A+C')

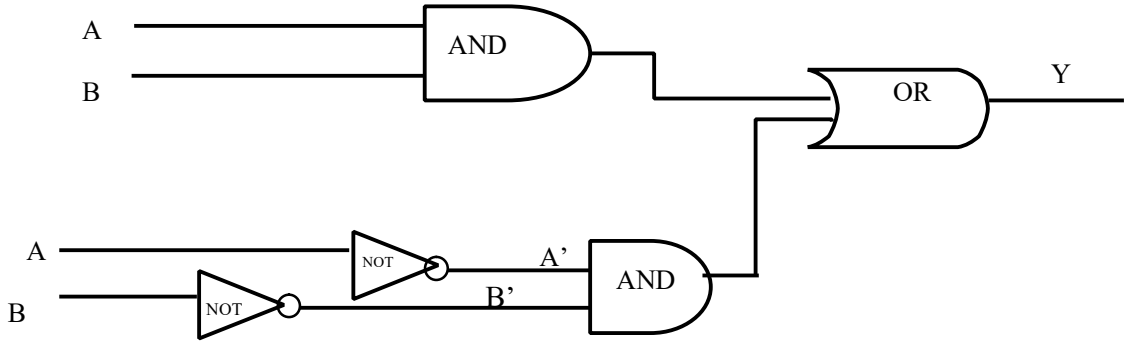
Apparatus required:-Digital Lab Kit, Single Strand Wires, ICs, breadboards, Connecting Wires.

Theory:-

a) **SOP**: - It is the Sum of product form in which the terms are taken as 1. It is denoted in the K-map expression by sigma (∑)

A.B+ A'B'

Logic Circuit Of this -

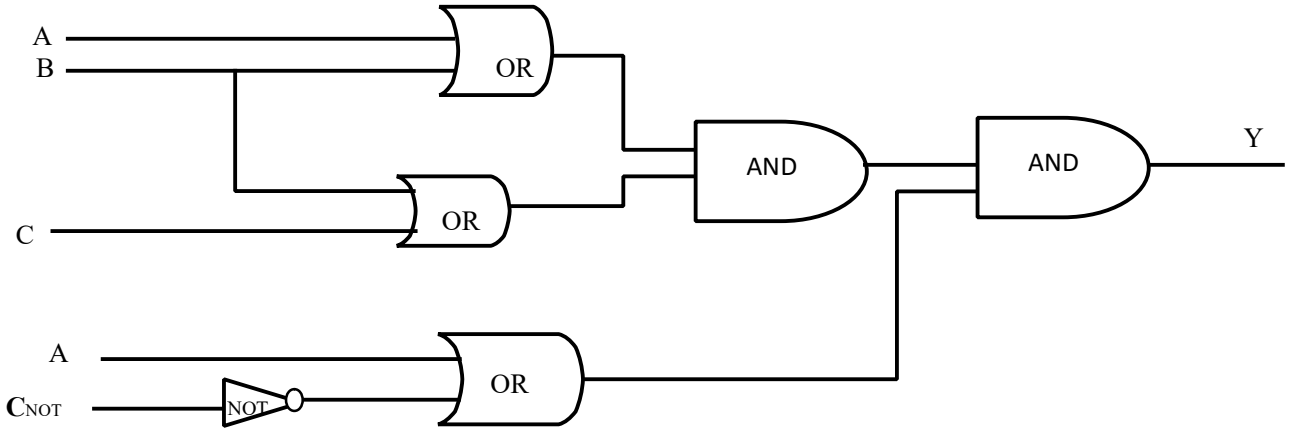


Truth Table for this SOP expression

A	B	A'	B'	A.B	A'. B'	Y= A.B + A'. B'
0	0	1	1	0	1	1
0	1	1	0	0	0	0
1	0	0	1	0	0	0
1	1	0	0	1	0	1

b) **POS**: - It is the product of the sums form in which the terms are taken as 0. It is denoted in the K-Map expression by the Sign pie (π)

Circuit Diagram



(A+B) (B+ C) (A + C')

Truth Table foe POS expression -

A	B	C	A+B	B+C	A+C'	Y= (A+B)(B+C)(A+C')
0	0	0	0	0	1	0
0	0	1	0	1	0	0
0	1	0	1	1	1	1
0	1	1	1	1	0	0
1	0	0	1	0	1	0
1	0	1	1	1	1	1
1	1	0	1	1	1	1
1	1	1	1	1	1	1

Procedure: -

For SOP form: - A.B + A'.B'

1. Place the Digital lab kit at one place.
2. Take the one AND gate ICs i.e. IC no.7408, one NOT gate IC i.e. IC no. 7404 and one OR gate IC i.e. IC no. 7432.
3. Place these 3 ICs in the breadboard one by one.
4. Now, connect the AND gate with the inputs of A and B and other AND gate in the same IC is given by the complement input of the A and B i.e. A' and B' by using NOT gate with the help of connecting wires.
5. Give the output voltage Vcc and GROUND to all the ICs separately.
6. When whole configuration is read, gently on the switch and note there output of different values of A and B i.e. either 0 or 1.

For POS form :- (A+B)(B+C)(A+C')

1. Place the Digital lab kit at one place.
2. Take the 1 **OR**, 1 **AND**, 1 **NOT** gates IC
3. Place these 3 ICs in the breadboard one by one.
4. Now, connect the OR gate of Input A or B, B or C and last one is A or C' (i.e. complement of C using NOT gate. Inputs are connected with the help of connecting wires.
5. When whole circuit is complete, on the switch and note down the output with different values of A, B and C.

Result:-Hence, given Boolean Expression is implemented by the Logic Gates

i.e. (i) A.B + A'.B'

(ii) (A+B) (B+C) (A+C')