Combinational logic circuit cont..

Combinational logic circuit cont..

Logic Gates

A

Digital
Inputs

B

C

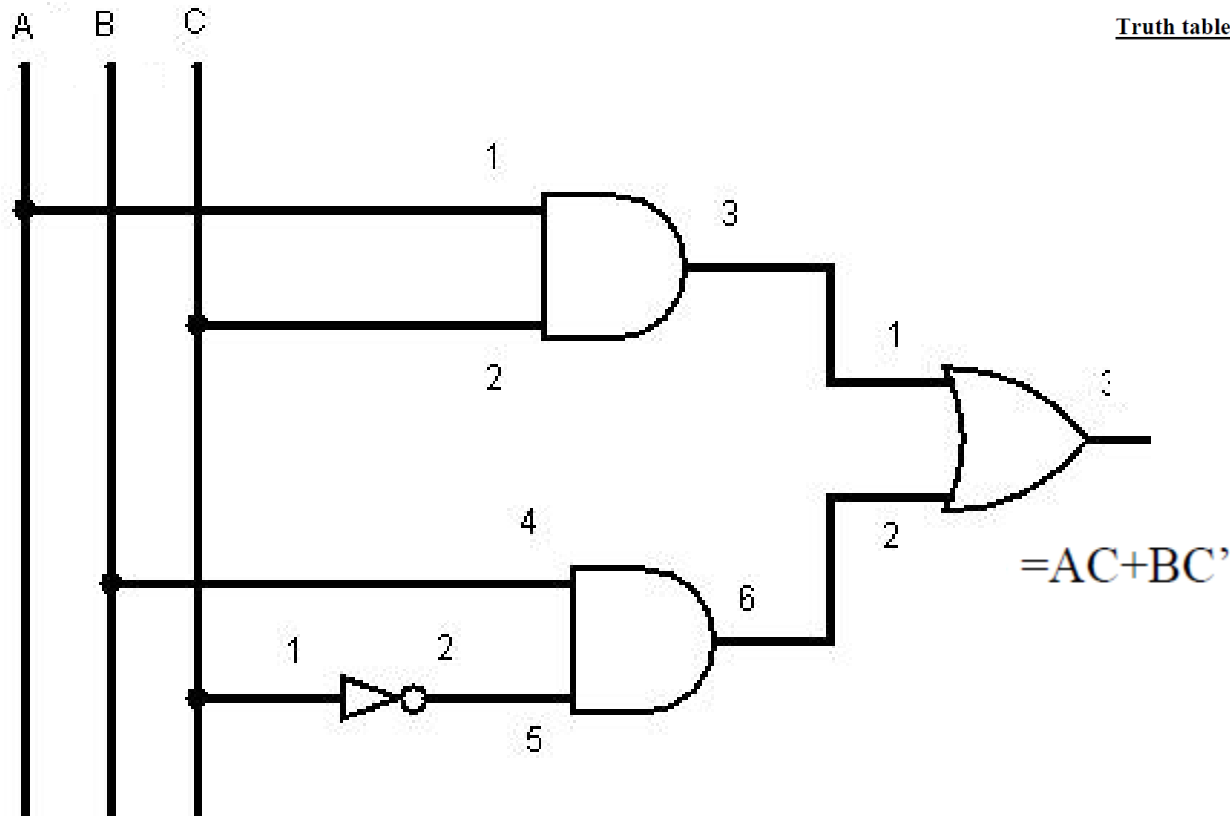$\overline{(A.B)}$

$\overline{(A+B)}$

Logic Diagram

Boolean Expression

$Q = \overline{(A.B)}.\overline{(A+B)}.C$

Output (Q)
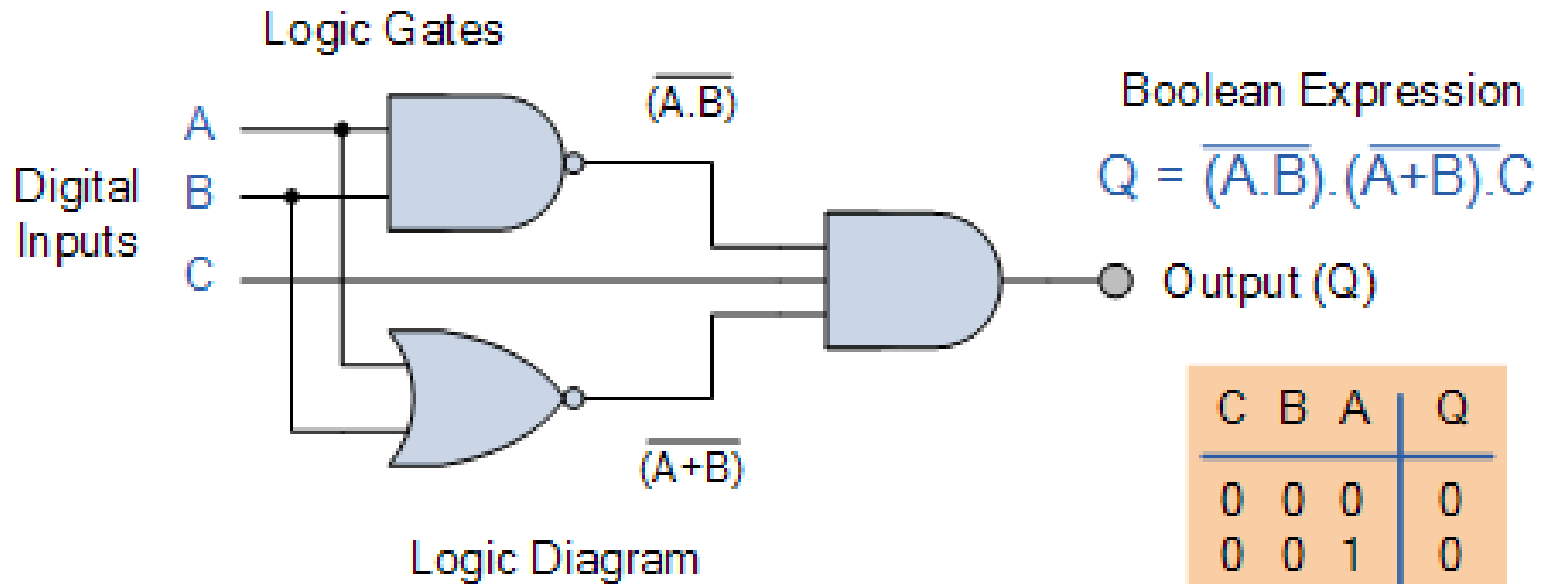
C	B	A	Q
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

Typical
Truth Table

Combinational logic circuit

Truth table:

A	B	C	f
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

$=AC+BC'$

❖**Derive the equations for the circuits and then construct the truth table.**

Combinational logic circuit

Truth table:

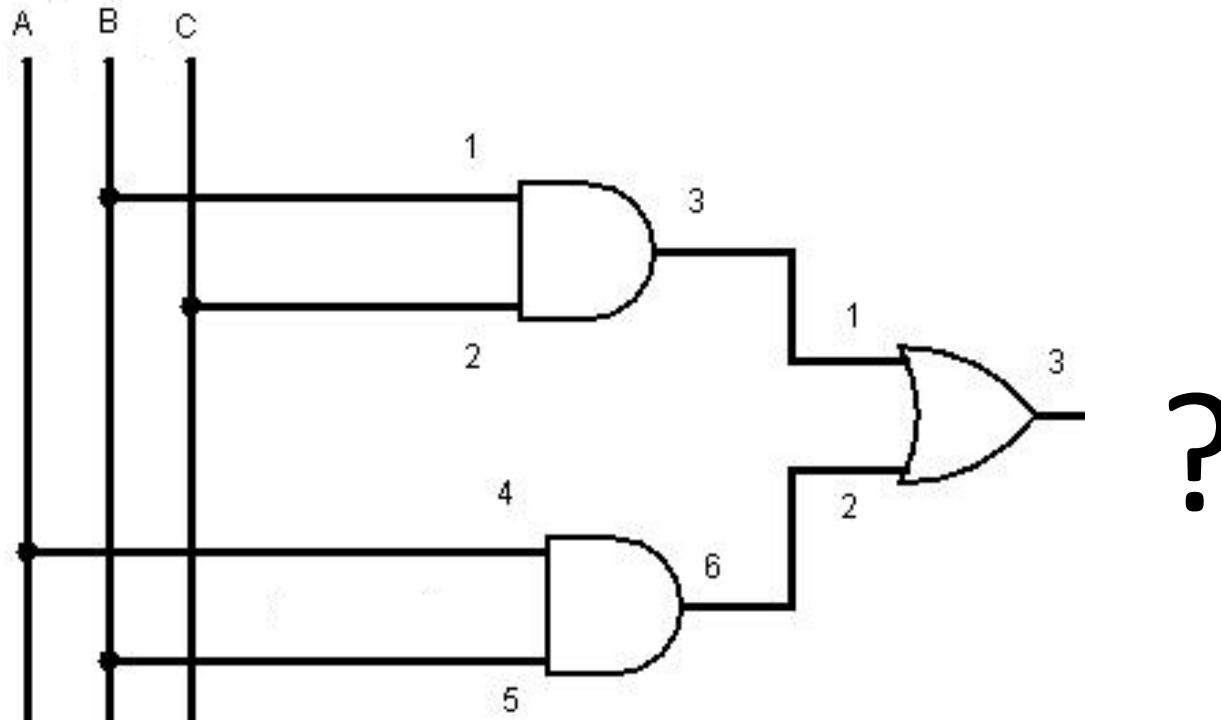| A	B	C	f
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

$$=(B+C)(A+C')$$

❖ **Derive the equations for the circuits and then construct the truth table.**
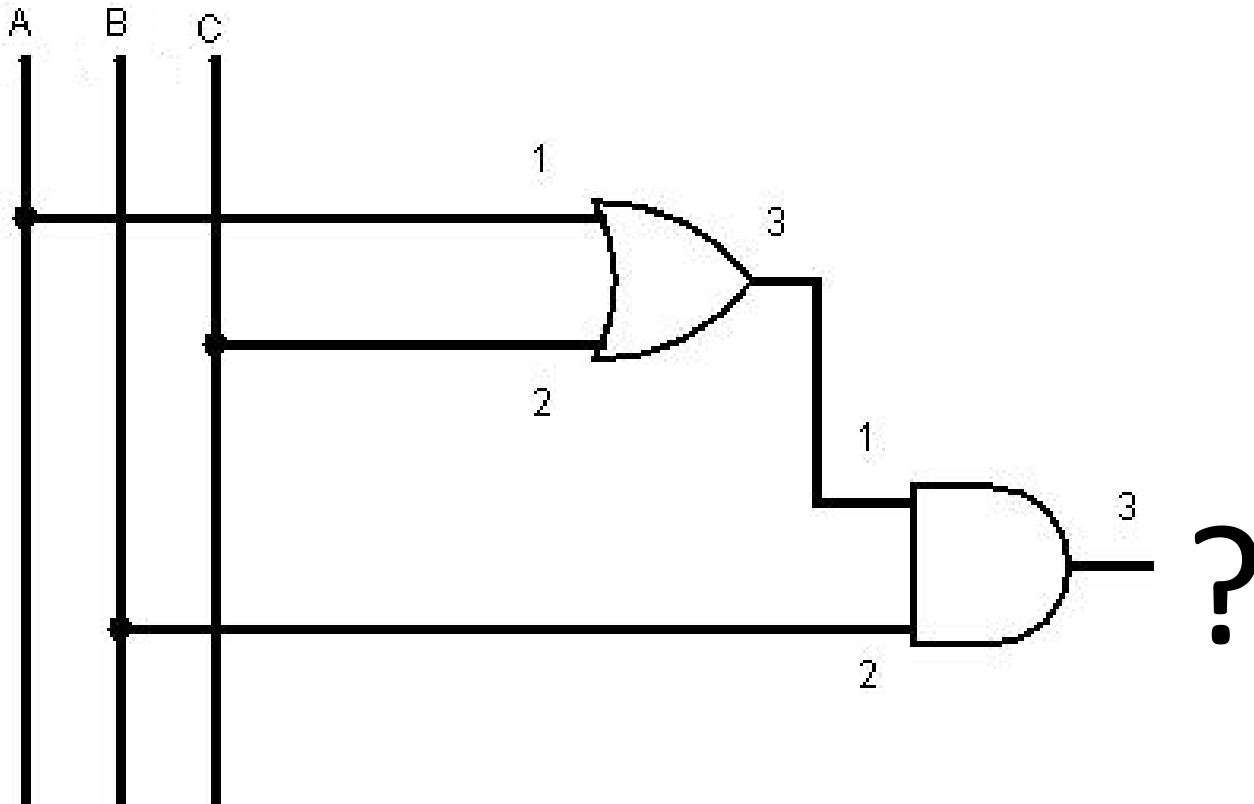
Combinational logic circuit

Truth table:

A	B	C	f
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

?

❖**Derive the equations for the circuits and then construct the truth table.**
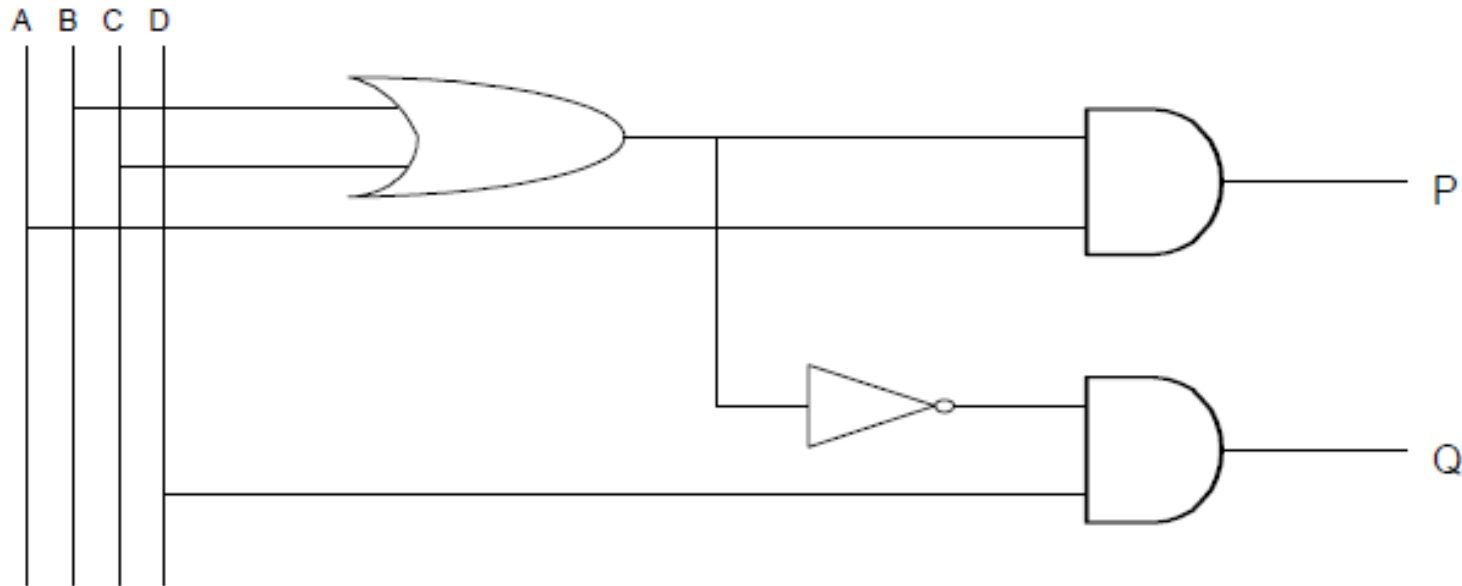
Combinational logic circuit

❖**Derive the equations for the circuits and then construct the truth table.**
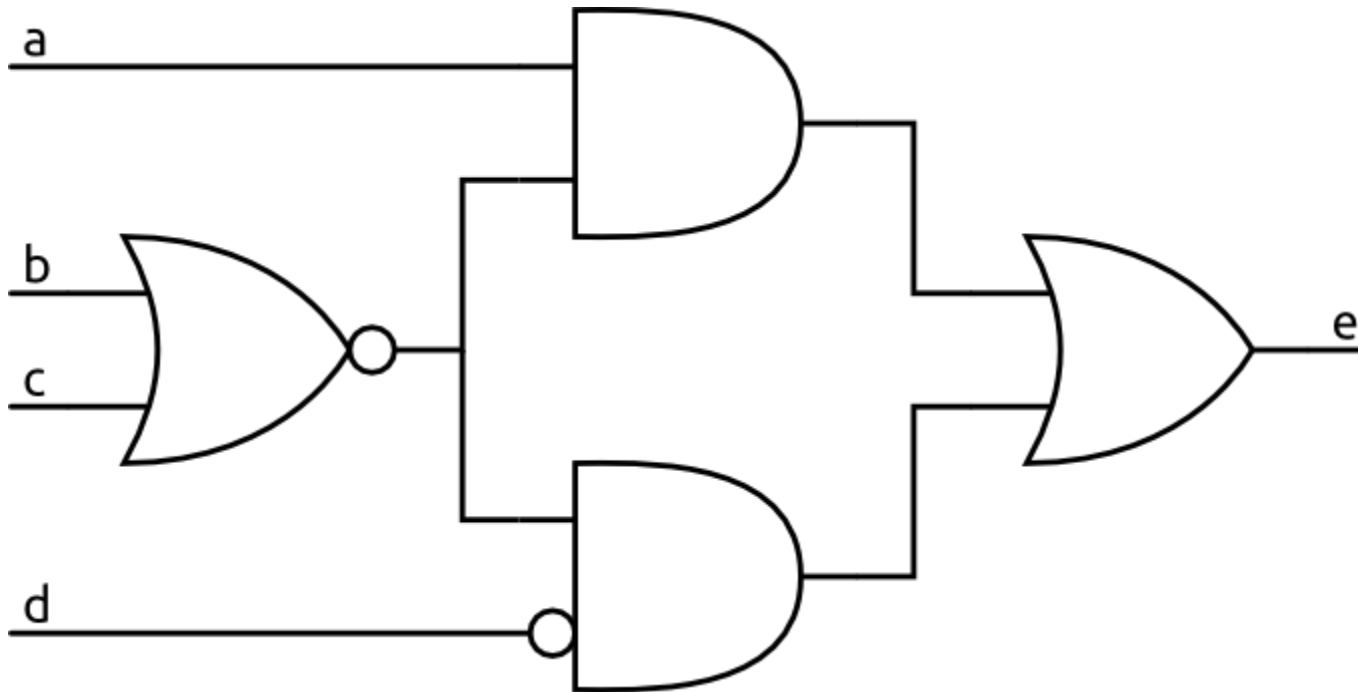
Implementation of function f= (AB+B).(C+A).(AC+B)

Combinational logic circuit

❖**Derive the equations for the circuits and then construct the truth table.**
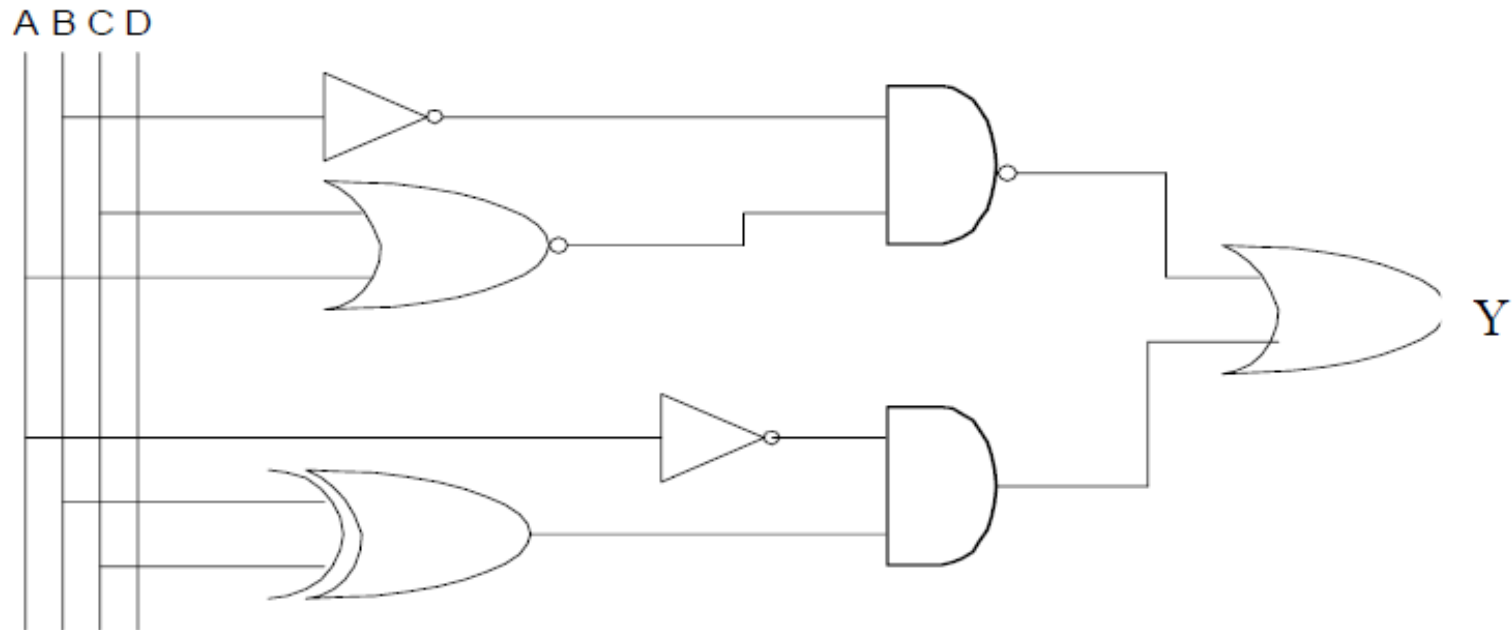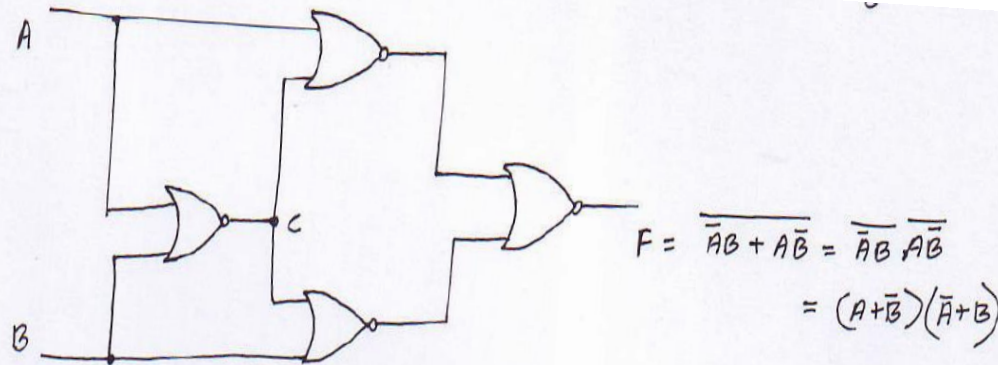
❖**Derive the equations for the circuits and then construct the truth table.**

Combinational logic circuit cont..

❖**Derive the equations for the circuits and then construct the truth table.**

Combinational logic circuit cont..

$$F = \overline{\overline{A}B + A\overline{B}} = \overline{\overline{A}B} \; \overline{A\overline{B}}$$
$$= (A + \overline{B})(\overline{A} + B)$$

$$C = \overline{A + B} = \overline{A} \, \overline{B}$$

$$\overline{A + C} + \overline{B + C} = (A + C)(B + C)$$
$$= C + AB$$
$$= \overline{A}\,\overline{B} + AB$$
$$= A \odot B$$

Truth table

❖**Derive the equations for the circuits and then construct the truth table.**

Try with four inputs