

ASSIGNMENT 01

Name : Mosraor Mofiz Arman

ID : 1921079642

Course : CSE231

Section : 10

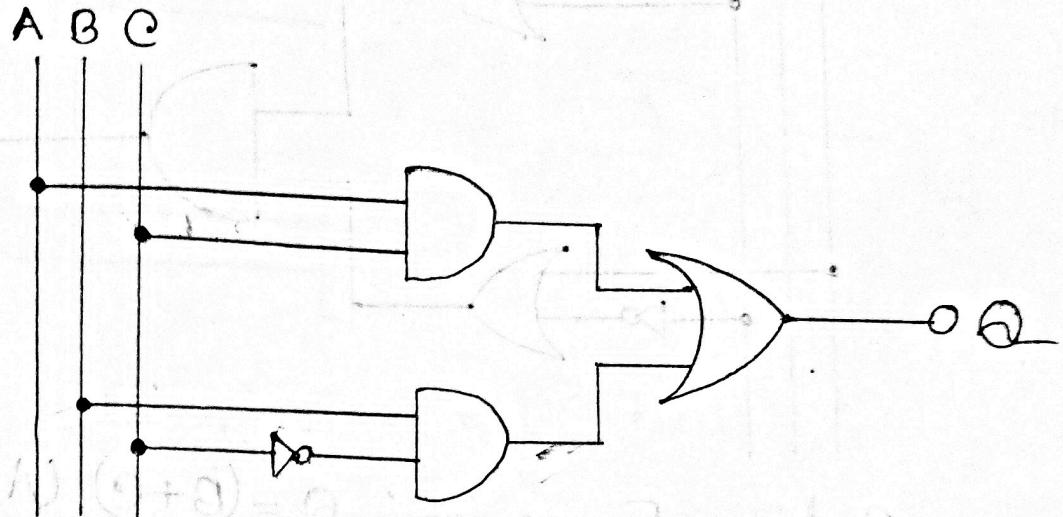
Submitted to : Dr. Mohammad Moniruzzaman

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Khan

Combinational logic circuit

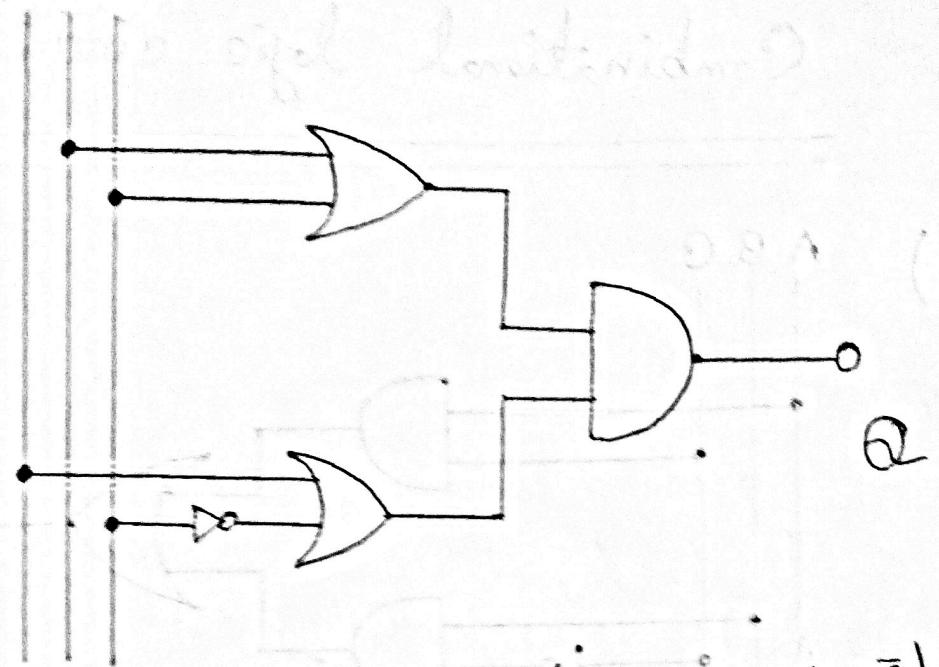
(1)



\therefore Boolean Expression : $Q = AC + B\bar{C}$

A	B	C	\bar{C}	AC	$B\bar{C}$	$AC + B\bar{C}$
0	0	0	1	0	0	0
0	0	1	0	0	0	0
0	1	0	1	0	1	1
0	1	1	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	1	0	1
1	1	0	1	0	1	1
1	1	1	0	1	0	1

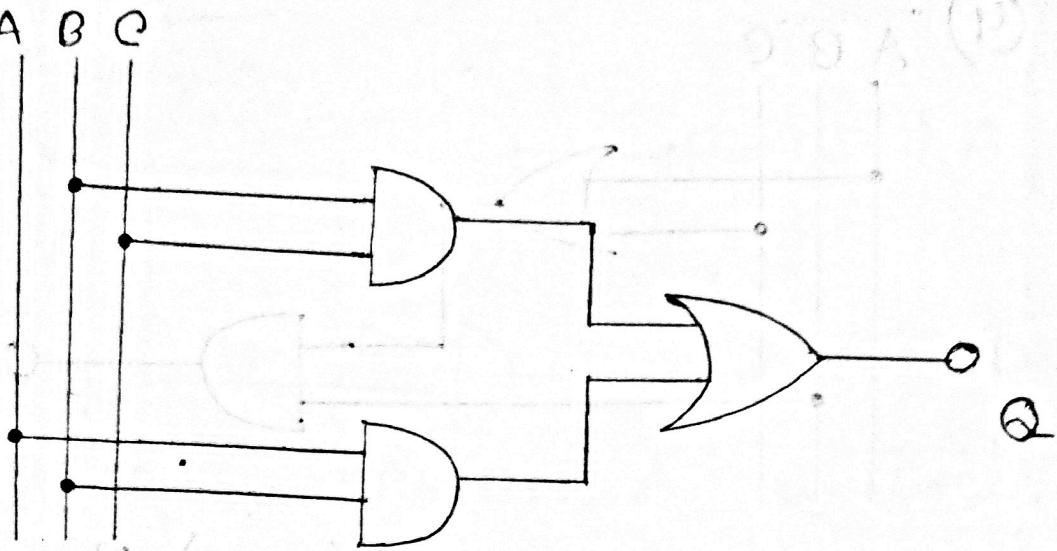
(2) ABC



$\therefore \text{Boolean Expression: } Q = (B + C) \cdot (A + \bar{C})$

A	B	C	\bar{C}	$(B+C)$	$(A+\bar{C})$	$(B+C) \cdot (A+\bar{C})$
0	0	0	1	0	1	0
0	0	1	0	1	0	0
0	1	0	1	1	1	1
0	1	1	0	1	0	0
1	0	0	1	0	1	0
1	0	1	0	1	1	1
1	1	0	1	1	1	1
1	1	1	0	1	1	1

(3)

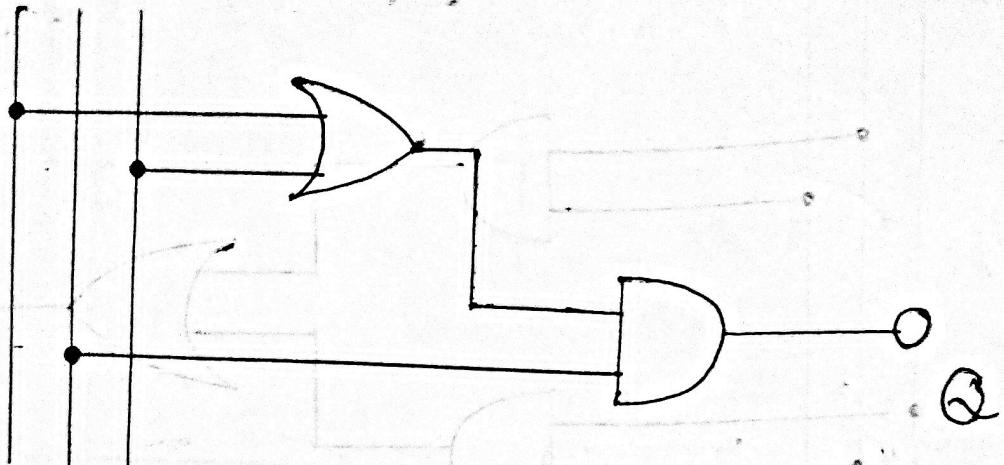


Boolean Expression : $Q = BC + AB$

A	B	C	BC	AB	$BC + AB$
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	1	0	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	0	1	1
1	1	1	1	1	1

(4)

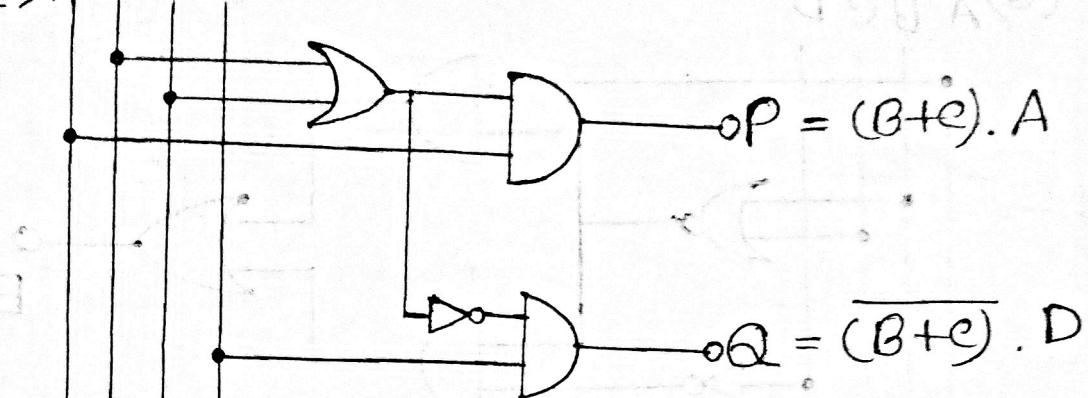
A B C



Boolean Expression: $Q = (A+C) \cdot B$

A	B	C	$(A+C)$	$(A+C) \cdot B$
0	0	0	0	0
0	0	1	1	0
0	1	0	0	0
0	1	1	1	1
1	0	0	1	0
1	0	1	1	0
1	1	0	1	1
1	1	1	1	1

(5) A B C D



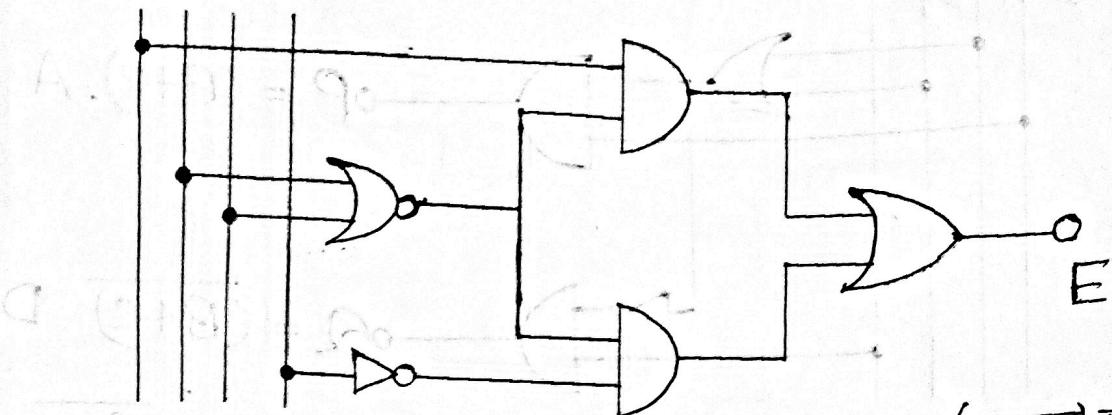
$$P = (B+C) \cdot A$$

$$Q = \overline{(B+C)} \cdot D$$

Boolean Expression : $P = (B+C) \cdot A$ $Q = \overline{(B+C)} \cdot D$

A	B	C	D	$(B+C)$	$\overline{(B+C)}$	$(B+C) \cdot A$	$\overline{(B+C)} \cdot D$
0	0	0	0	0	1	0	0
0	0	0	1	0	1	0	1
0	0	1	0	1	0	0	0
0	0	1	1	1	0	0	0
0	1	0	0	1	0	0	0
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	0
0	1	1	1	1	0	0	0
1	0	0	0	0	1	0	0
1	0	0	1	0	1	0	1
1	0	1	0	1	0	1	0
1	0	1	1	1	0	1	0
1	1	0	0	1	0	1	0
1	1	0	1	1	0	1	0
1	1	1	0	1	0	1	0
1	1	1	1	1	0	1	0

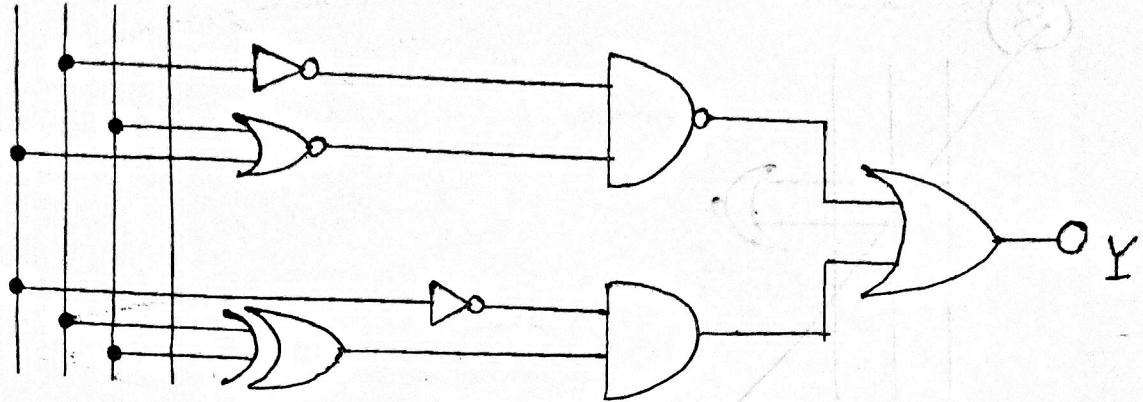
(6) A B C D



Boolean Expression : $E = (A \cdot (\overline{B+C})) + ((\overline{B+C}) \cdot \overline{D})$.

A	B	C	D	\overline{D}	$(\overline{B+C})$	$(A \cdot (\overline{B+C}))$	$(\overline{B+C}) \cdot \overline{D}$	$(A \cdot (\overline{B+C})) + ((\overline{B+C}) \cdot \overline{D})$
0	0	0	0	1	1	0	1	1
0	0	0	1	0	1	0	0	0
0	0	1	0	1	0	0	0	0
0	0	1	1	0	0	0	0	0
0	1	0	0	1	0	0	0	0
0	1	0	1	0	0	0	0	0
0	1	1	0	1	0	0	0	0
0	1	1	1	0	0	0	0	0
1	0	0	0	1	1	1	1	1
1	0	0	1	0	1	1	0	1
1	0	1	0	1	0	0	0	0
1	0	1	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0
1	1	0	1	0	0	0	0	0
1	1	1	0	1	0	0	0	0
1	1	1	1	0	0	0	0	0

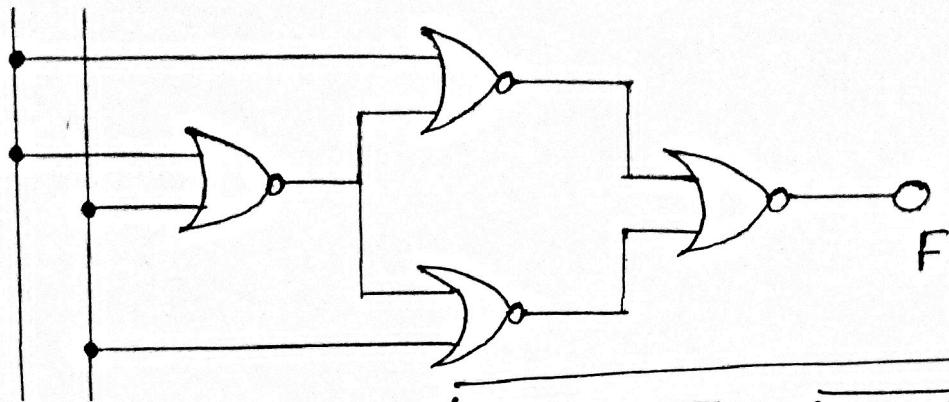
(7) A B C D



Boolean Expression: $Y = (\overline{B} \cdot (\overline{A} + \overline{C})) + (\overline{A} \cdot B \oplus C)$

A	B	C	D	\bar{A}	\bar{B}	$(A+C)$	$(\bar{A}+C)$	$(B \oplus C)$	$\bar{B} \cdot (\bar{A}+C)$	$(\bar{A} \cdot B \oplus C)$	$\bar{B} \cdot (\bar{A}+C) + (\bar{A} \cdot B \oplus C)$
0	0	0	0	1	1	0	1	0	0	0	0
0	0	0	1	1	1	0	1	0	0	0	0
0	0	1	0	1	1	1	0	1	1	1	1
0	0	1	1	1	1	1	1	0	1	1	1
0	1	0	0	1	0	0	1	1	1	1	1
0	1	0	1	1	0	0	1	1	1	1	1
0	1	1	0	1	0	1	0	0	1	0	1
0	1	1	1	1	0	1	0	0	1	0	1
1	0	0	0	0	1	1	0	0	1	0	1
1	0	0	1	0	1	1	0	0	1	0	1
1	0	1	0	0	0	1	1	0	1	0	1
1	0	1	1	0	1	1	0	1	1	0	1
1	1	0	0	0	0	0	1	0	1	0	1
1	1	0	1	0	0	1	0	1	1	0	1
1	1	1	0	0	0	1	0	0	1	0	1
1	1	1	1	0	0	1	0	0	1	0	1

(8) A B



Boolean Expression : $F = \overline{(\overline{A} + (\overline{A+B}))} + \overline{((\overline{A+B})+B)}$

A	B	$\overline{A+B}$	$(A+(\overline{A+B}))$	$(A+B)+B$	$\overline{(A+(\overline{A+B}))} + \overline{((A+B)+B)}$
0	0	1	0	0	1
0	1	0	1	0	0
1	0	0	0	1	0
1	1	0	0	0	1