

OCR Computer Science A Level

1.4.3 Boolean Algebra

Flashcards



Which logic gate is this?



Which logic gate is this?



Exclusive Disjunction (XOR)



What is the equation symbol
for conjunction?



What is the equation symbol for conjunction?

\wedge



Which is the truth table for AND?

A

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

B

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

C

A	B	Y
0	0	0
0	1	1
1	0	0
1	1	1

D

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

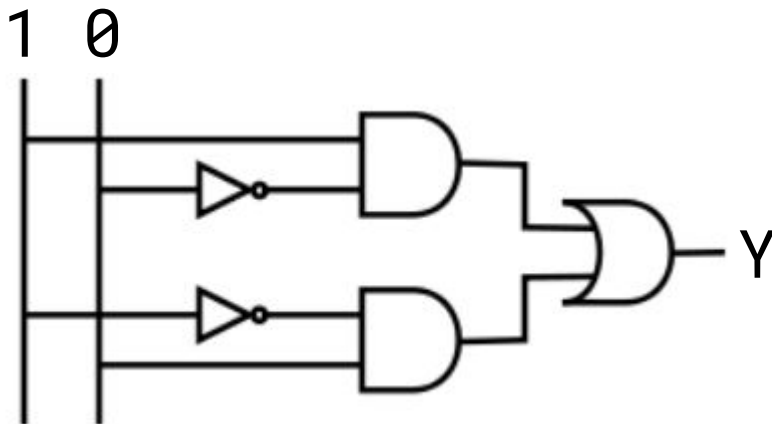


Which was the truth table for AND?

D



What will the value of Y be
in this logic circuit?



What would be the value of Y in the logic circuit?

1



State De Morgan's laws



State De Morgan's laws

$$\neg(A \vee B) \equiv \neg A \wedge \neg B$$

$$\neg(A \wedge B) \equiv \neg A \vee \neg B$$



Simplify the Boolean expression

$$\neg B \wedge \neg(A \vee B)$$



Simplify the Boolean expression $\neg B \wedge \neg(A \vee B)$

$$\neg A \wedge \neg B$$



Apply one of De Morgan's laws to the
Boolean expression $\neg A \wedge \neg B$



Apply one of De Morgan's laws to the Boolean expression $\neg A \wedge \neg B$

$$\neg(A \vee B)$$



What is the purpose of a D-type flip flop?



What is the purpose of a D-type flip flop?

To store the value of a single bit



When is the stored value in a
D-type flip flop updated?



When is the stored value in a D-type flip flop updated?

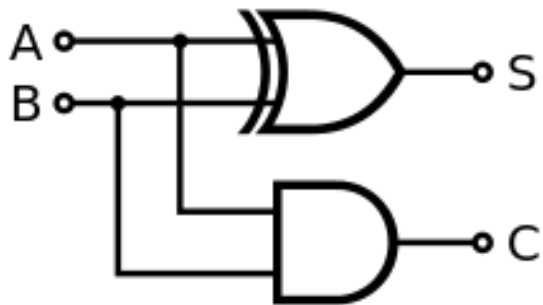
On the rising edge of the clock signal



What is the logic circuit for a half adder?



What is the logic circuit for a half adder?



Apply a distributive rule to the
Boolean expression

$$A \vee (B \wedge C)$$



Apply a distributive rule to the Boolean expression $A \vee (B \wedge C)$

$$(A \vee B) \wedge (A \vee C)$$



Complete the truth table for a full adder

A	B	C _{in}	C _{out}	Sum
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		



Complete the truth table for a full adder

A	B	C _{in}	C _{out}	Sum
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

