



# PHYSICS

## BOOKS - AAKASH SERIES

### LOGIC GATES

#### Example

1. Draw the logic circuit corresponding to the Boolean expression.  $Y = AB + \bar{B}C$ .



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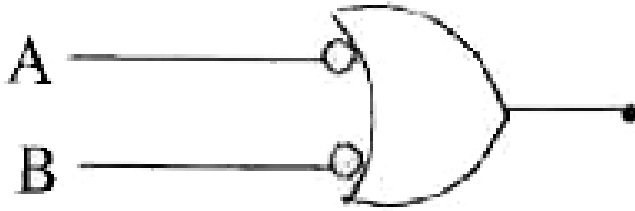
2. Simplify  $Y = AB + ABC + \bar{A}B + A\bar{B}C$  using Boolean Algebra. Draw the resultant simplified logic circuit.



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3. Write Boolean equation for the output of fig. and solve this equation for all possible

input conditions.



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4. Draw logic diagrams for the Boolean expressions given below.

(i)  $A \cdot \bar{B} + \bar{A} \cdot B = Y$  , (ii)

$(A + \bar{B}) \cdot (\bar{A} + B) = Y$

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## Exercise Short Answer

1. If the output of a 2-input NOR gate is fed as the input to a NOT gate

- (i) Name the new logic gate obtained
- (ii) Write down its truth table.



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2. Describe the working of XOR logic gate?



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3. What is a NAND gate ? Write its truth table.



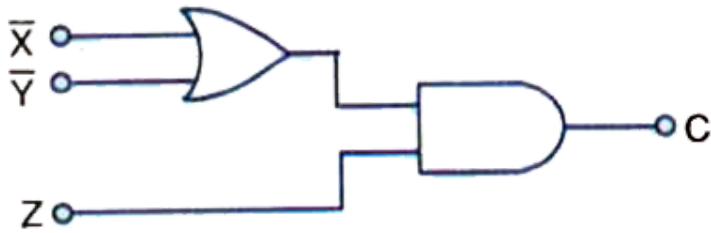
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4. Using diodes construct an OR gate and an AND gate?



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**Exercise Very Short Answer**



1.

The output  $C$  in the above circuit is given by  $C$

= ---



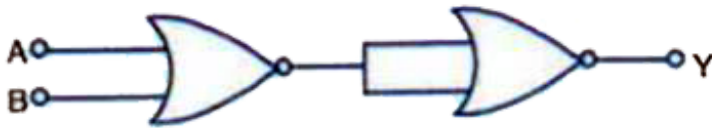
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2. Which logic function has the output "low" only when both inputs are "high"?



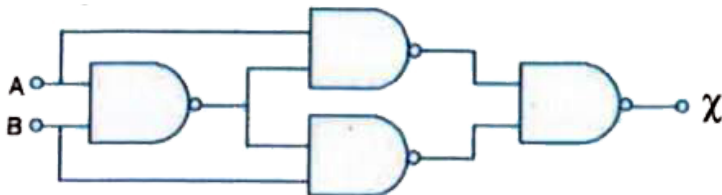
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3. Write down the truth table for output Y for all possible inputs A and B in the following circuit:



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4.

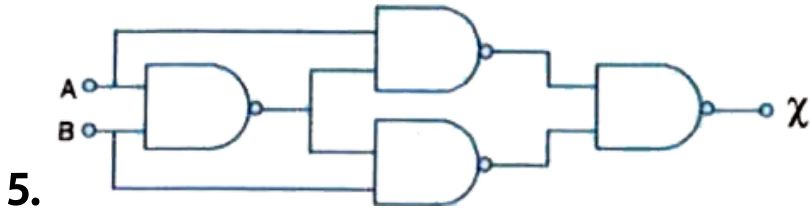


Evaluate the output Y for the inputs A= 1 and B

=0



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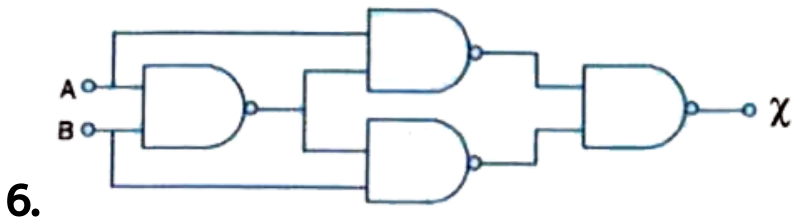
Evaluate the output Y for the inputs  $A=1$  and  $B$

$= 1$



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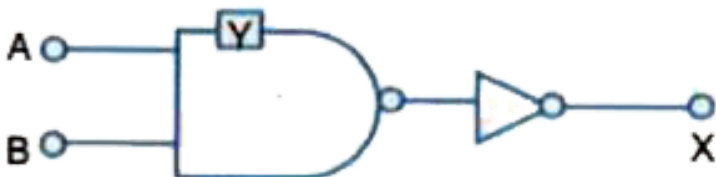




Evaluate the output Y for the inputs  $A = 0$  and  $B = 0$

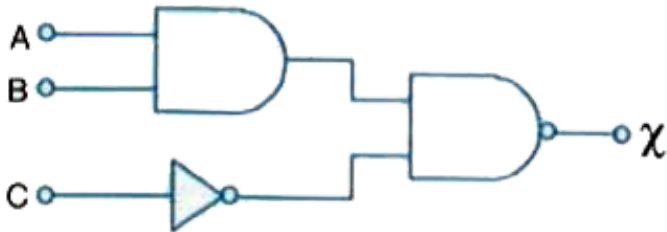
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7. The following diagram represents the logic function of which gate?





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8.

In the given circuit, find the output Y for each of the following inputs.

(a)  $A=1, B = 1, C=0$

(b)  $A=1, B = 1, C = 1$



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A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

9.

State the Boolean expressions for the given truth table.



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**10.** State two logic functions in which the output is "low" when both inputs are "low"



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