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AS - Computer Science 9618
Sir Aaqib Khan
Paper - 1

Topic: P1- Chapter - 3

Logic GatesWorksheet

Student Name: Sir AQIB Khan

Class: TAK - AS - 2026

Question No. 1 [Sir Aaqib Khan]

[May / June - 2021 / Paper - 11 / Question No 8]

8 Tick (✓) **one** box in each row to identify the logic gate that each statement describes.

	Statement	AND	NAND	NOR	XOR	OR
a	The output is 1 only when both inputs are 1	✓				
b	The output is 1 only when both inputs are different				✓	
c	The output is 1 only when both inputs are 0			✓		

[3]

NOR

A	B	NOR
0	0	1
0	1	0
1	0	0
1	1	0

$B' = \overline{B}$

NAND

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

X

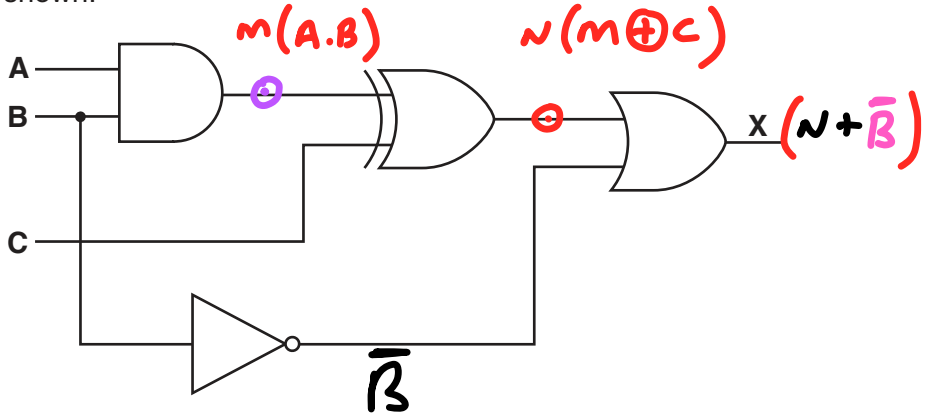
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Question No. 2 [Sir Aaqib Khan]

[Oct / Nov - 2021 / Paper - 11 / Question No 3]

3 A logic circuit is shown:



(a) Write the logic expression for the logic circuit.

(A AND B XOR C) OR(NOT B)

.....

.....

[3]

(b) Complete the truth table for the given logic circuit.

A	B	C	m A.B	Working space m⊕C	n B̄	X
0	0	0	0	0	1	1
0	0	1	0	1	1	1
0	1	0	0	0	0	0
0	1	1	0	1	0	1
1	0	0	0	0	1	1
1	0	1	0	1	1	1
1	1	0	1	1	0	1
1	1	1	1	0	0	0

[2]

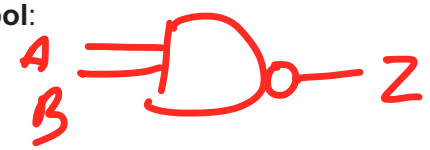
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(c) Identify **one** logic gate **not** used in the given logic circuit. Draw the symbol for the logic gate **and** complete its truth table.

Logic gate: NAND

Symbol:



Truth table:

A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0

[3]

NOR



A	B	Z
0	0	1
0	1	0
1	0	0
1	1	0

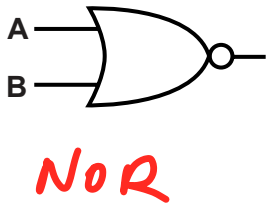
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Question No. 3 [Sir Aaqib Khan]

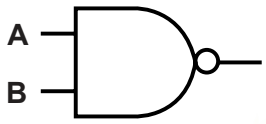
[Oct / Nov - 2021 / Paper - 12 / Question No 2]

2 (a) Complete the truth table for each of the following two logic gates.



NOR

A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



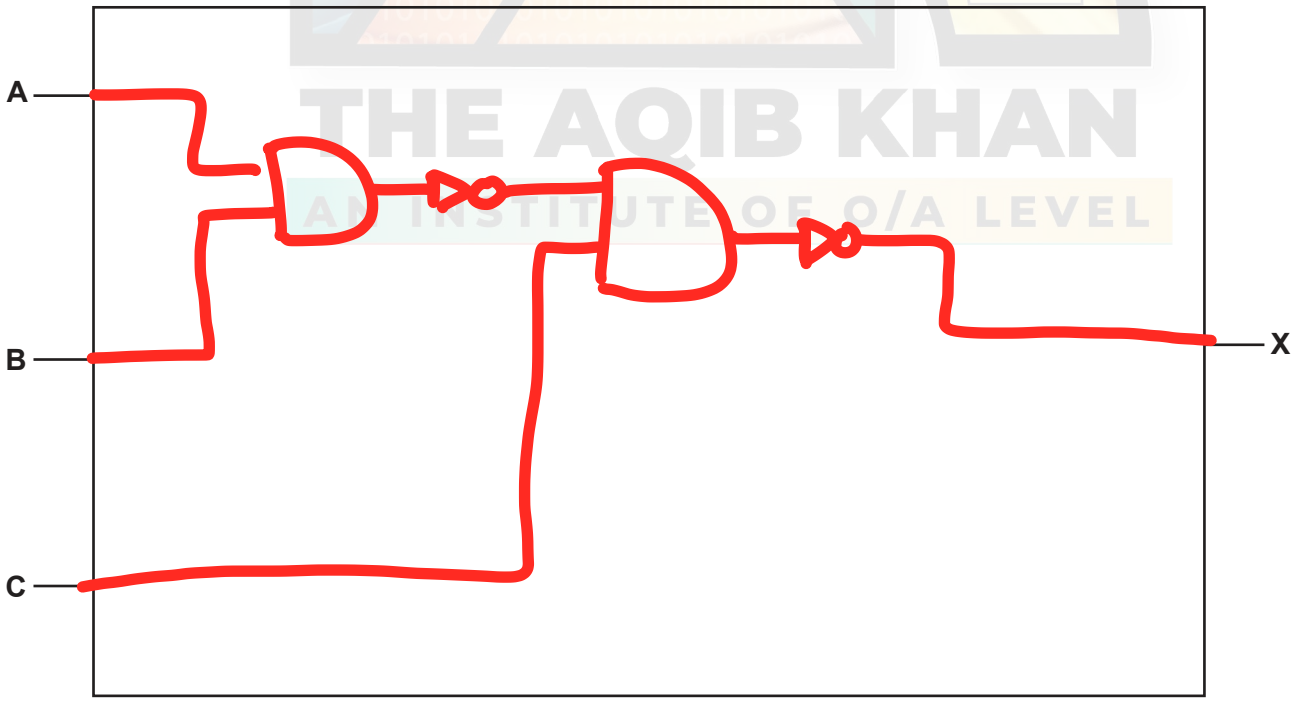
NAND

A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0

[2]

(b) Draw a logic circuit for the following logic expression.

X = NOT(NOT(**A** AND **B**)AND **C**)



[2]

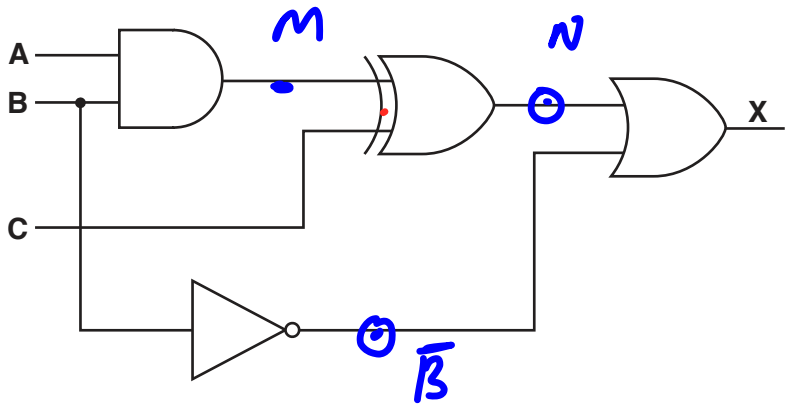
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Question No. 4 [Sir Aaqib Khan]

[Oct / Nov - 2021 / Paper - 13 / Question No 3]

3 A logic circuit is shown:



(a) Write the logic expression for the logic circuit.

((A AND B) XOR C) OR NOT B

.....

.....

[3]

(b) Complete the truth table for the given logic circuit.

A	B	C	Working space			X
			M: A.B	$\bar{B}$	N: M⊕C	
0	0	0	0	1	0	1
0	0	1	0	1	1	1
0	1	0	0	0	0	0
0	1	1	0	0	1	1
1	0	0	0	1	0	1
1	0	1	0	1	1	1
1	1	0	1	0	1	1
1	1	1	1	0	0	0

$\bar{N} + \bar{B}$

[2]

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(c) Identify **one** logic gate **not** used in the given logic circuit. Draw the symbol for the logic gate **and** complete its truth table.

Logic gate: ..... NAND .....

Symbol:



Truth table:

A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0

[3]

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Question No. 5 [Sir Aaqib Khan]

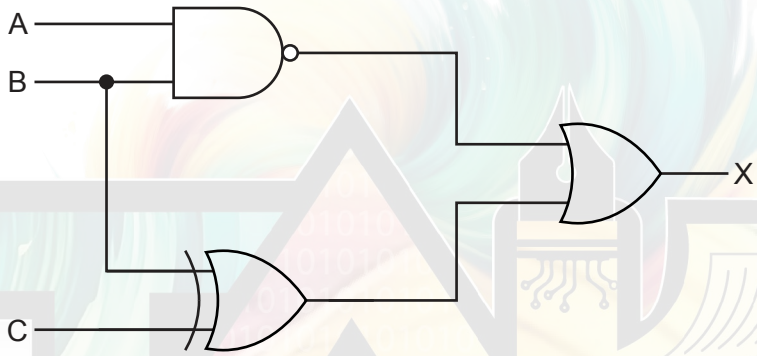
[May / June - 2022 / Paper - 11 / Question No 2]

(i) Complete the table by writing **one** set of values (input 1 and input 2) for each gate that will give the output 1.

Gate	Input 1	Input 2	Output
AND	1	1	1
NAND	0	0	1
XOR	0	1	1
NOR	0	0	1

[4]

(ii) Write the logic expression for the given logic circuit.



(A NAND B) OR (B XOR C)

[3]

NAND

A	B	Z
0	0	1
0	1	1
1	0	1
1	1	0

output is 0 only when Both inputs are 1
otherwise outputs are 1

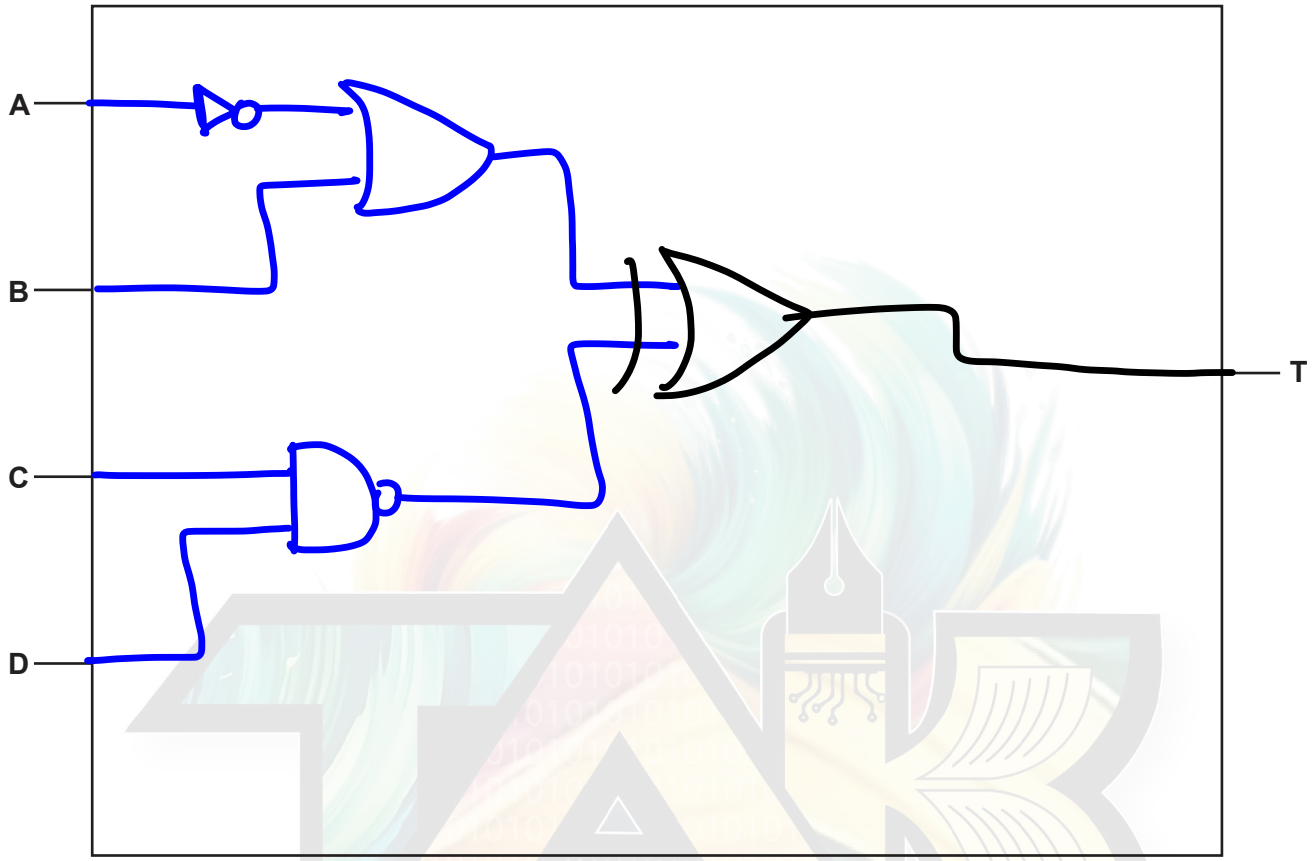
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Question No. 6 [Sir Aaqib Khan]

[May / June - 2023 / Paper - 11 / Question No 5]

5 (a) Draw the logic circuit for this logic expression:

T = (NOT **A** OR **B**) XOR (**C** NAND **D**)



[2]

(b) Describe the function of the NAND and NOR logic gates.

NAND When both inputs are 1 then output is 0, otherwise outputs are 1

NOR When both inputs are 0 then output is 1 otherwise output is 0.

[2]

NAND

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

NOR

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

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Question No. 7 [Sir Aaqib Khan]

[May / June - 2024 / Paper - 12 / Question No 1]

1 (a) Describe the operation of each of the following logic gates:

NAND — The output is 0 when both inputs are 1, otherwise output is 1

NOR — output is 1 when both inputs are 0, otherwise output is 0

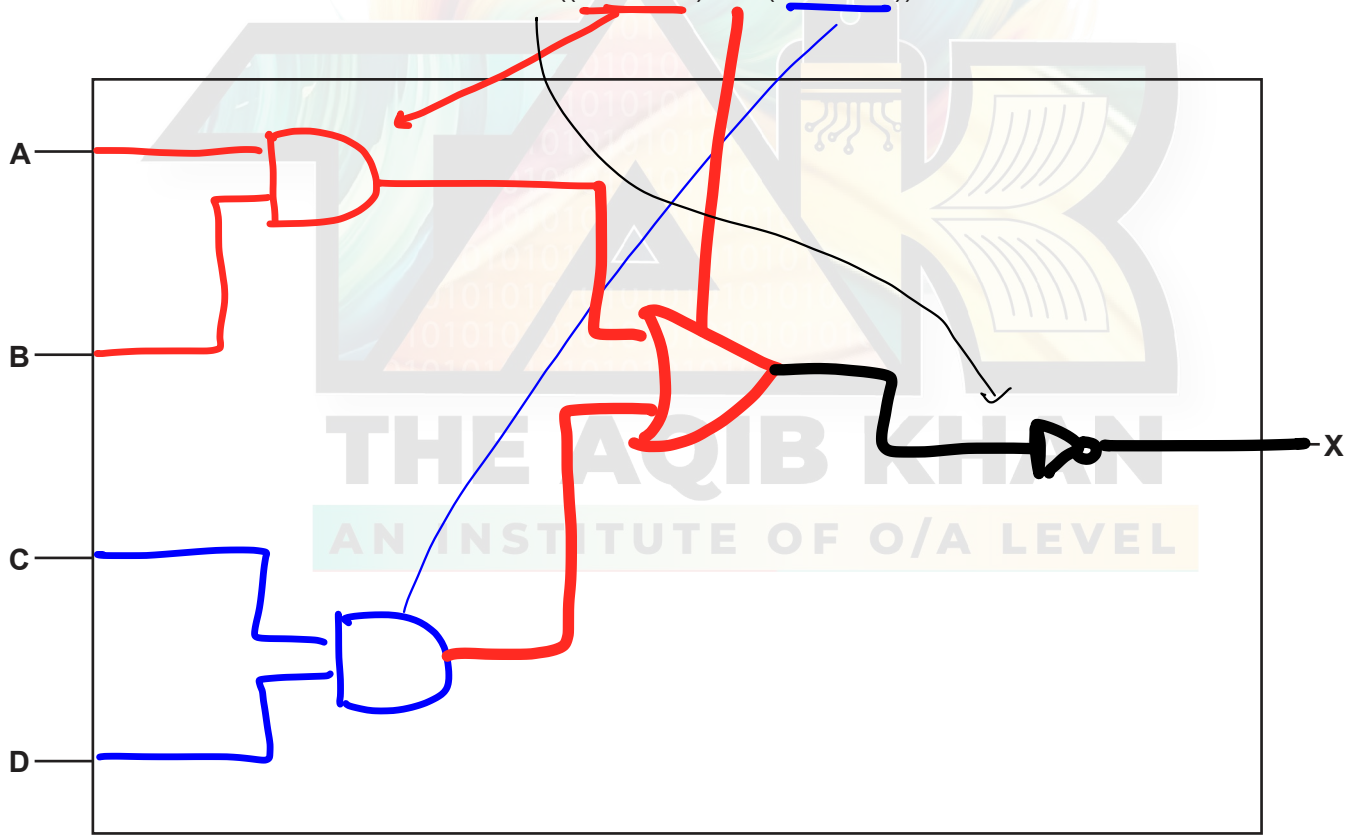
XOR — output is 1, when one of the input is 1 and other input is 0, otherwise output is 0

OR — output is 0 when both inputs are 0 otherwise the output is 1.

[4]

(b) Draw a logic circuit for this logic expression:

X = NOT ((**A** AND **B**) OR (**C** AND **D**))



[2]

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