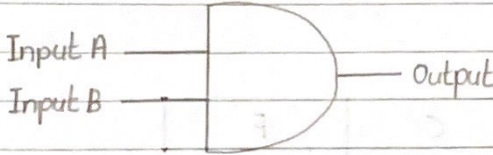
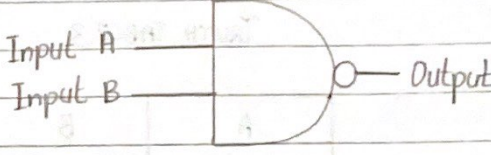
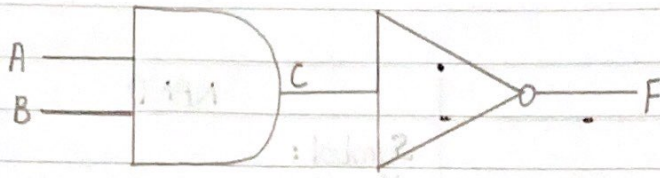


D. PRELIMINARY WORK

1. Draw a symbol, determine the IC number and produce a truth table for the following gate.

AND		NAND																																					
Symbol :		Symbol :																																					
																																							
IC number : 7408		IC number : 7400																																					
TRUTH TABLE 1		Truth table 2																																					
<table border="1"><thead><tr><th colspan="2">INPUT</th><th>OUTPUT</th></tr><tr><th>A</th><th>B</th><th>F</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></tbody></table>		INPUT		OUTPUT	A	B	F	0	0	0	0	1	0	1	0	0	1	1	1	<table border="1"><thead><tr><th colspan="2">INPUT</th><th>OUTPUT</th></tr><tr><th>A</th><th>B</th><th>F</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></tbody></table>		INPUT		OUTPUT	A	B	F	0	0	1	0	1	1	1	0	1	1	1	0
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0	0	1																																					
0	1	1																																					
1	0	1																																					
1	1	0																																					

2. Complete the truth table for the following circuit.

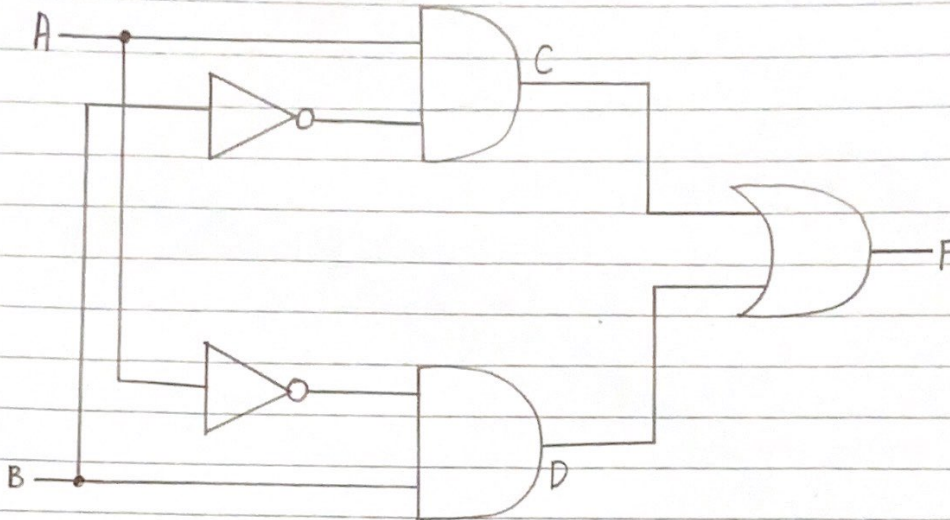


TRUTH TABLE 3

A	B	C	F
0	0	0	1
0	1	0	1
1	0	0	1
1	1	1	0

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

3. Write the Boolean expression for output C, D and F the following circuit.



$$C = A \cdot \bar{B}$$

$$D = \bar{A} \cdot B$$

$$F = C + D$$

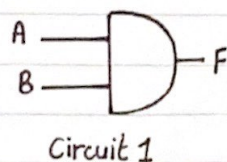
4. Complete the truth table for the circuit in (3) based on the Boolean expression produced for C, D and F.

A	B	C	D	F
0	0	0	0	0
0	1	0	1	1
1	0	1	0	1
1	1	0	0	0

E. LABORATORY WORK

PART 1

- Construct Circuit 1 on the breadboard. Connect all inputs (A, B) to a switches and output F to LEDs.

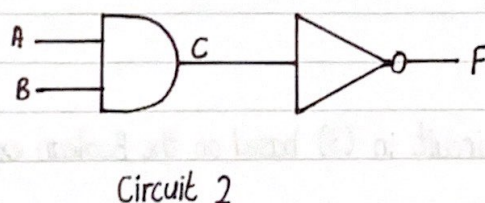


TRUTH TABLE 5

Input		Output
A	B	F
0	0	0
0	1	0
1	0	0
1	1	1

PART 2

- Construct Circuit 2 on the breadboard. Connect all inputs (A, B) to a switches and output C and F to LEDs.



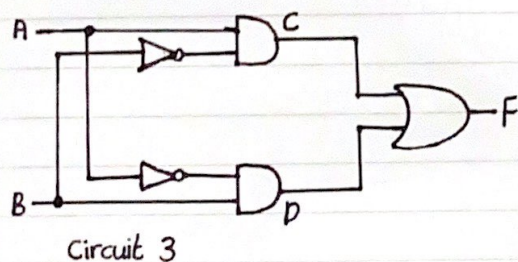
TRUTH TABLE 6

A	B	C	F
0	0	0	1
0	1	0	1
1	0	0	1
1	1	1	0

- Compare Truth Table 6 to Truth Table 2. What conclusion can you make?
The output F is the same so basically this circuit can act as a NAND gate.

PART 3

- Construct circuit 3 on the breadboard. Connect all inputs (A, B) to a switches and output C, D and F to LEDs.



TRUTH TABLE 7

A	B	C	D	F
0	0	0	0	0
0	1	0	1	1
1	0	1	0	1
1	1	0	0	0

- What single gate does Circuit 3 represent?
XOR gate