Department of Computer Science
Faculty of Computing
UNIVERSITI TEKNOLOGI MALAYSIA

SUBJECT NAME: **DIGITAL LOGIC**

SUBJECT CODE: **SECR1013**

SEMESTER: **1**

LAB TITLE: **LAB 1: COMBINATIONAL LOGIC**

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SUBMITTED DATE: 29 / 11 / 2021

COMMENTS:

MARKS:

Department of Computer Science
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SUBJECT	:	SCSR1013 DIGITAL LOGIC
SESSION/SEM	:	01 / SEM 1
LAB 1	:	**COMBINATIONAL LOGIC**
NAME 1	:	HARCHANA A/P ARULAPPAN (A21EC0028)
NAME 2	:	NASRUL AMIN BIN AB HADI (A21EC0099)
DATE	:	27 NOVEMBER 2021

REMARKS :

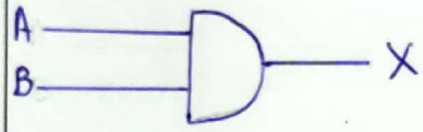
MARKS:

D. Preiminary Work

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

AND

Symbol:



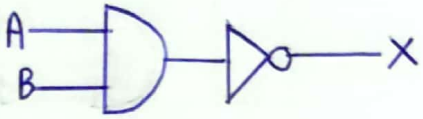
IC Number: ....7408.....

Truth Table 1

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

NAND

Symbol:

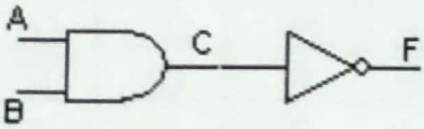


IC Number: ....7400.....

Truth Table 2

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

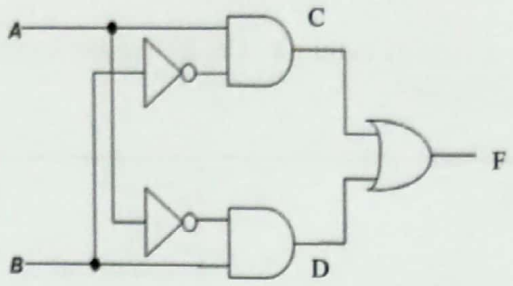
2. Complete the truth table for the following circuit.



Truth Table 3

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

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



C = $A\bar{B}$

D = $\bar{A}.B$

F = $(A\bar{B}) + (\bar{A}B)$

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

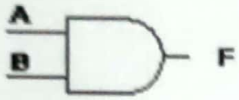
Truth Table 4

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

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



Circuit 1

Truth Table 5

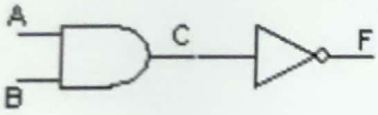
Input		Output
A	B	F
0	0	0
0	1	0
1	0	0
1	1	1

2. Test Circuit 1 and fill in Truth Table 5 for the circuit response to all possible input combinations. The Truth Table 5 should match the Truth Table 1 prepared in the Preliminary Work.

Fully Completed ☐ *Partially Completed* ☐ *Checked by:* _____

Part 2

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



Circuit 2

Truth Table 6

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

4. Test Circuit 2; fill in Truth Table 6, for the circuit response to all possible input combinations.

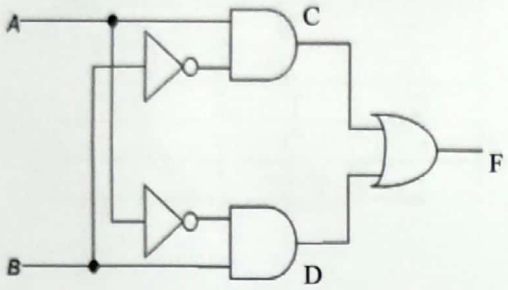
5. Compare Truth Table 6 to Truth Table 2. What conclusion can you make?

Both of the truth table have the same output. If all or any of the input are Low, then the output is high. If all of the input are high, then the output is Low.

Fully Completed ☐ *Partially Completed* ☐ *Checked by:* _____

Part 3

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



Circuit 3

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

7. Test Circuit 3; fill in Truth Table 7 for the circuit outputs (C, D, and F) for all possible input combinations.

8. What single gate does Circuit 3 represent?

XOR Gate,

Fully Completed ☐ *Partially Completed* ☐ *Checked by:* _____