CSE260 LAB ASSIGNMENT 5

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SECTION: 06

$C = AB$

$S = A \oplus B$

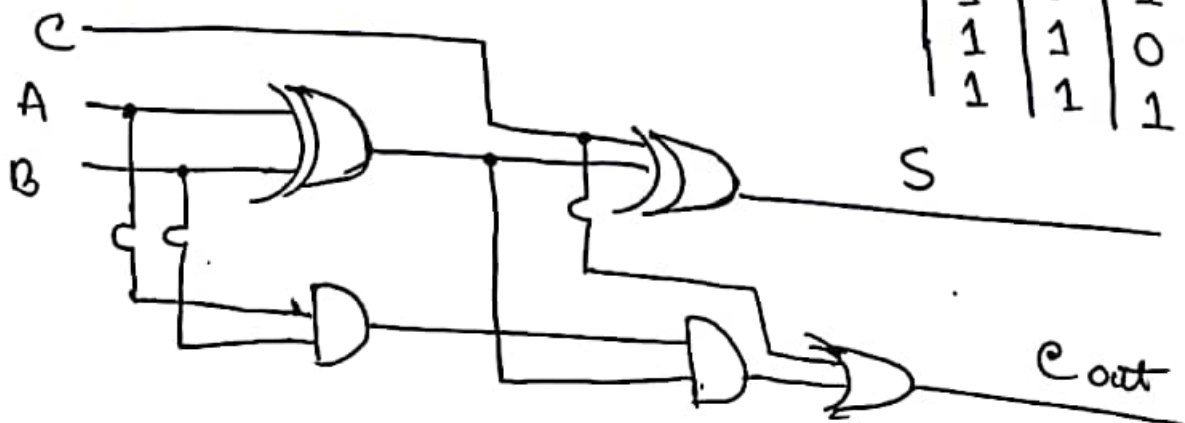| A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

$S = A \oplus B \oplus C$

Incomplete

$C = AB + (A \oplus B)C$

x	y	z	C	S
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

Lab Assignment 3

Report

(1) Name of Experiment: Design and implementation of 4-bit Parallel Binary Adder

(2) Objective:
- Obtain knowledge about the procedure behind addition in a digital device.
- Use 4 bit parallel adder which can take upto 4 bits binary number.
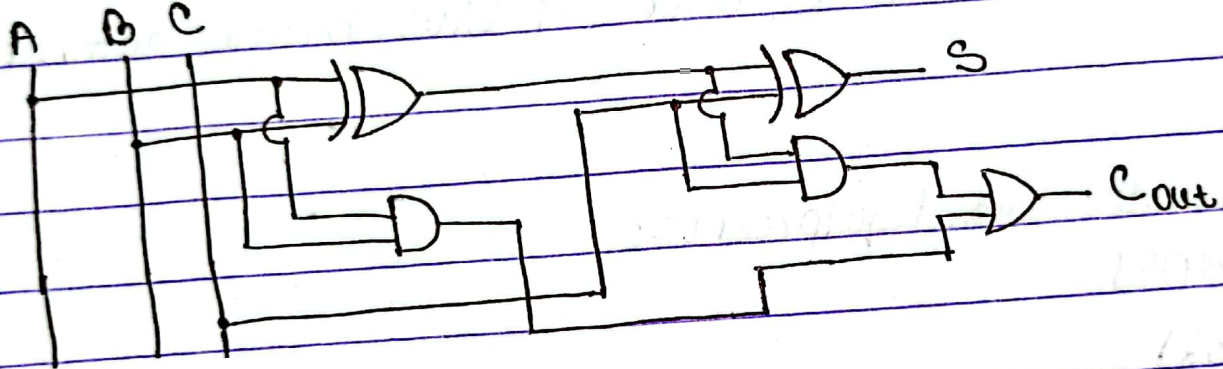
(3) Required Components and Equipments:
- AND (IC - 7408)
- OR (IC - 7432)
- XOR (IC - 7486)
- 4 bit parallel adder (IC - 7483)
- Jumper wiring
- GND
- VCC (+5 v)
- ~~Switch~~
- Breadboard.
- Switch

(A) Experimental Setup (Circuit diagram)

Half adder:
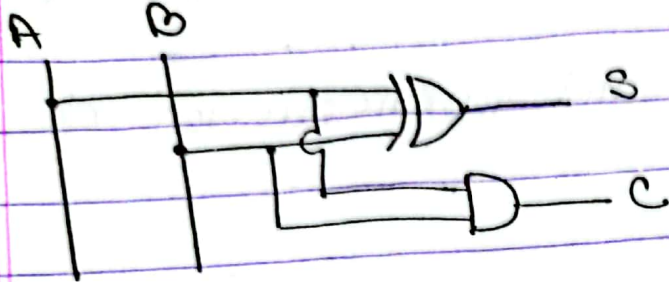
full adder:

4 bit parallel adder:
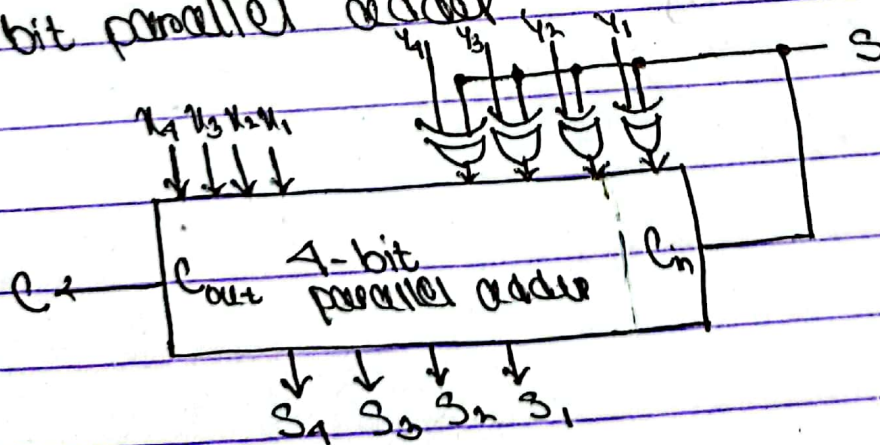
(5) Results (Truth Tables) and Discussions (suggestions, improvements/difficulties you faced etc).

Results:

half adder

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

$$S = A'B + AB' = A \oplus B$$
$$C = AB$$

full adder

A	B	C	S	C_{out}
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

$$S = A'B'C + A'BC' + AB'C' + ABC = A \oplus B \oplus C$$
$$C_{out} = A'BC + AB'C + ABC' + ABC = C(A \oplus B) + AB$$

4 bit parallel adder

C_{in}	x_4	x_3	x_2	x_1	y_4	y_3	y_2	y_1	s_4	s_3	s_2	s_1	C_{out}
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	1	0	0	1	0	0
0	0	0	1	1	0	0	0	1	0	1	0	0	0
0	0	0	1	1	0	0	1	0	0	1	0	1	0
0	0	1	0	0	0	0	1	1	0	1	1	1	0
0	0	1	0	1	0	0	1	1	1	0	0	0	0
0	0	1	0	1	0	1	0	0	1	0	0	1	0
0	0	1	1	1	0	1	0	1	1	1	0	0	1
0	1	0	0	0	0	1	1	0	0	0	1	0	1
0	1	0	0	0	0	1	1	1	0	0	1	0	1
0	1	0	1	0	1	0	1	1	0	1	0	0	1
0	1	0	1	0	1	0	1	0	0	1	0	0	1
0	1	1	0	0	1	1	0	1	0	1	1	0	1
0	1	1	0	1	1	1	0	0	1	1	0	0	1
0	1	1	1	1	0	1	1	0	1	1	1	0	1

$$C_{out} = C_{i+1} = x_i y_i + (x_i \oplus y_i) c_i$$

$$S_i = x_i \oplus y_i \oplus c_i$$

Discussions

- Short circuit occurs due to loose connections of wiring or defect in ICs. ~~So we have to check the~~
- If wires and ICs are not checked before ~~makin~~ building the circuit, any faults or damage in them ~~may~~ occurs in inaccurate output.