Learning Material - Experiment in ICT 2

Week 8

Goal of week

Student will be known about how to implement Exclusive OR from NAND, OR and how to build a **full adder** using NAND, OR and XOR logic gate.

Content and requirement

1. Analyze XOR logic gate, try to design XOR logic gate using OR, NAND logic gate.

2. Analyze full adder using OR, NAND, XOR logic gate.
   Draw schematic circuit and assemble it in breadboard.

$$S = A \oplus B \oplus C_{in} \quad \text{and} \quad C_{out} = (A \cdot B) + (C_{in} \cdot (A \oplus B))$$

Experimental Equipment

1.	Equipment Guideline		7. 74LS86 (4x XOR2)	x1
2.	5V Power		8. Led	x8
3.	Breadboard	x1	9. Resistor 330Ω	x3
4.	Multimeter	x1	10. Button A, B, Cin	x3
5.	74LS00 (4x NAND2)	x2	or switch	
6.	74LS32 (4x OR2)	x1		

Experimental Steps

1. Analyze XOR logic gate, convert XOR(2 input) logic gate function to approximated function using OR logic gate or using NAND logic gate
2. Draw circuit implement fulladder using IC 74LS00, IC 74LS32 and IC74LS86
3. Assemble your full adder circuit in breadboard using IC 74LS00, IC74LS32, and IC74LS86
4. Supply power and use multimeter test output state for each input conditions.

Experimental Report

All student must have a report, explain everything they does in this experiment with the content:
   - Draw circuit's schematic.
   - Inform all result getting from this experiment
   - Give some remark