Instruction:

Complete all questions in **2 hour.**

Group: A

1. Unit of computer capable of performing arithmetic, logical and data manipulation operation on binary numbers is called
   a. CU
   b. ALU
   c. I/O units
   d. Processing Unit

2. Arithmetic logic unit
   I. perform arithmetic operations
   II. store data
   III. perform comparison
   IV. communicate with input devices

   From above Correct one is.
   a. I only
   b. II only
   c. I and II only
   d. I and III only

3. Which of the following is component of ALU?
   a. Functional Unit
   b. Multiplexor
   c. Instruction Decoder
   d. All of the Above

4. Operations of Computer Arithmetic and logic unit is directed by
   a. ALU itself
   b. Program
   c. Control Unit
   d. Memory Unit

5. An arithmetic logic unit (ALU) is a _____ digital electronic circuit.
   a. Combinational
   b. Sequential
   c. Both
   d. None of above

6. Engineering design of arithmetic logic unit determines the
   a. Type and number of storing operations
   b. Type and number of logical operations
   c. Type and number of control operations
   d. Type and number of logical and arithmetic operations

7. Which is the function of Decoder?
    a. Perform logic and arithmetic operation
    b. Selects the output we want from ALU
    c. Send output choice made through the decoder
    d. None of the above

8. Which of the following is the function of Multiplexor?
    a. Perform logic and arithmetic operation
    b. Selects the output we want from ALU
    c. Send output choice made through the decoder
    d. None of the above

9. Both addition and subtraction can be performed by a single circuit using _____
    a. Multiplexor
    b. Controlled Inversion
    c. Half Adder
    d. Fuller Adder

<div align="center">Group B</div>

10. Design a combinational Logic circuit that selects and generates any of the following logic and arithmetic functions listed below.
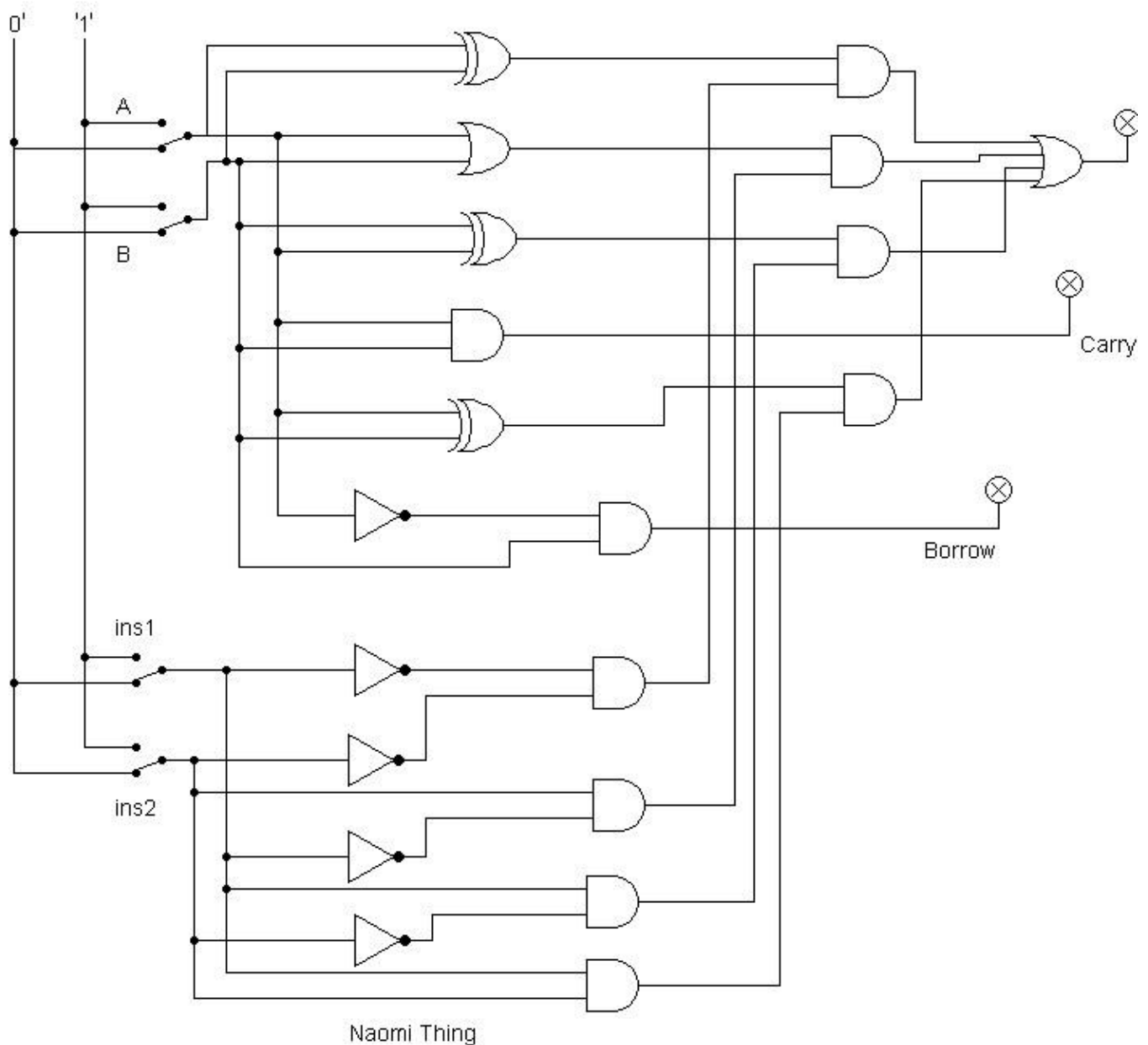
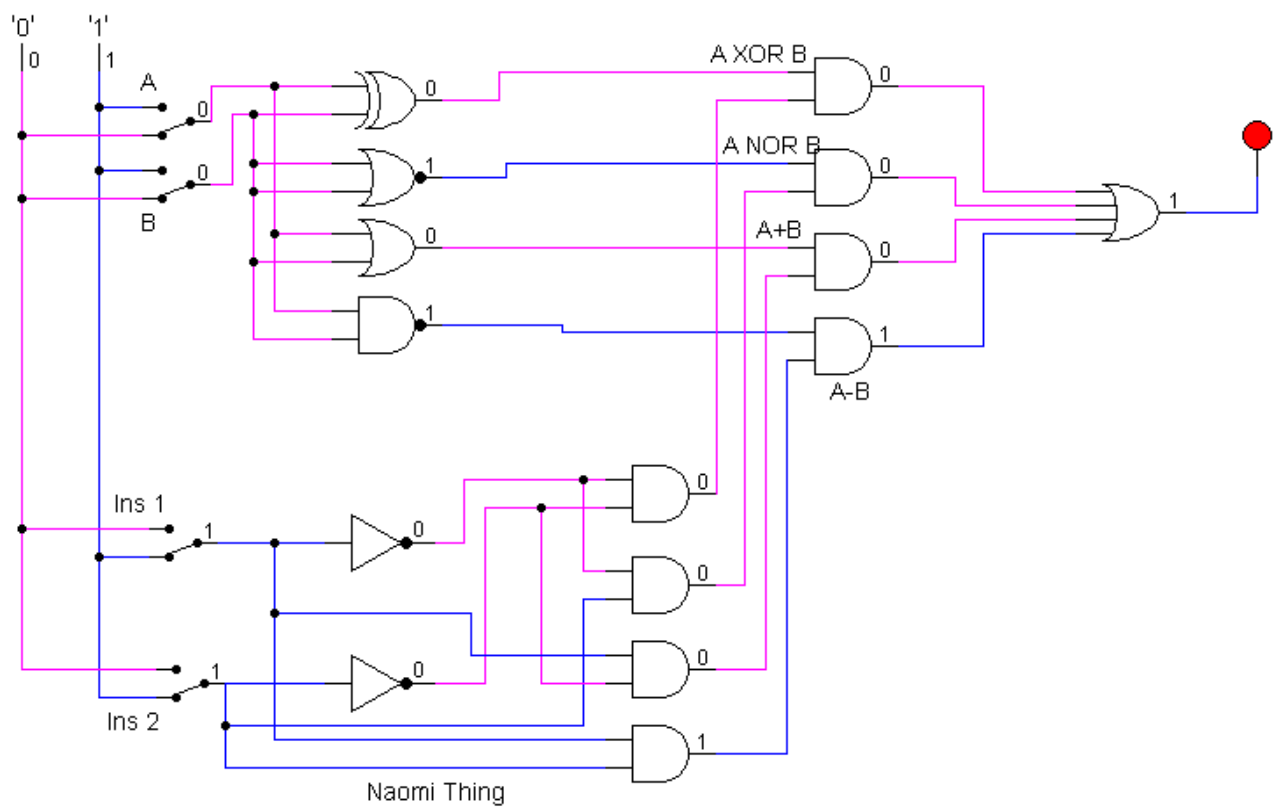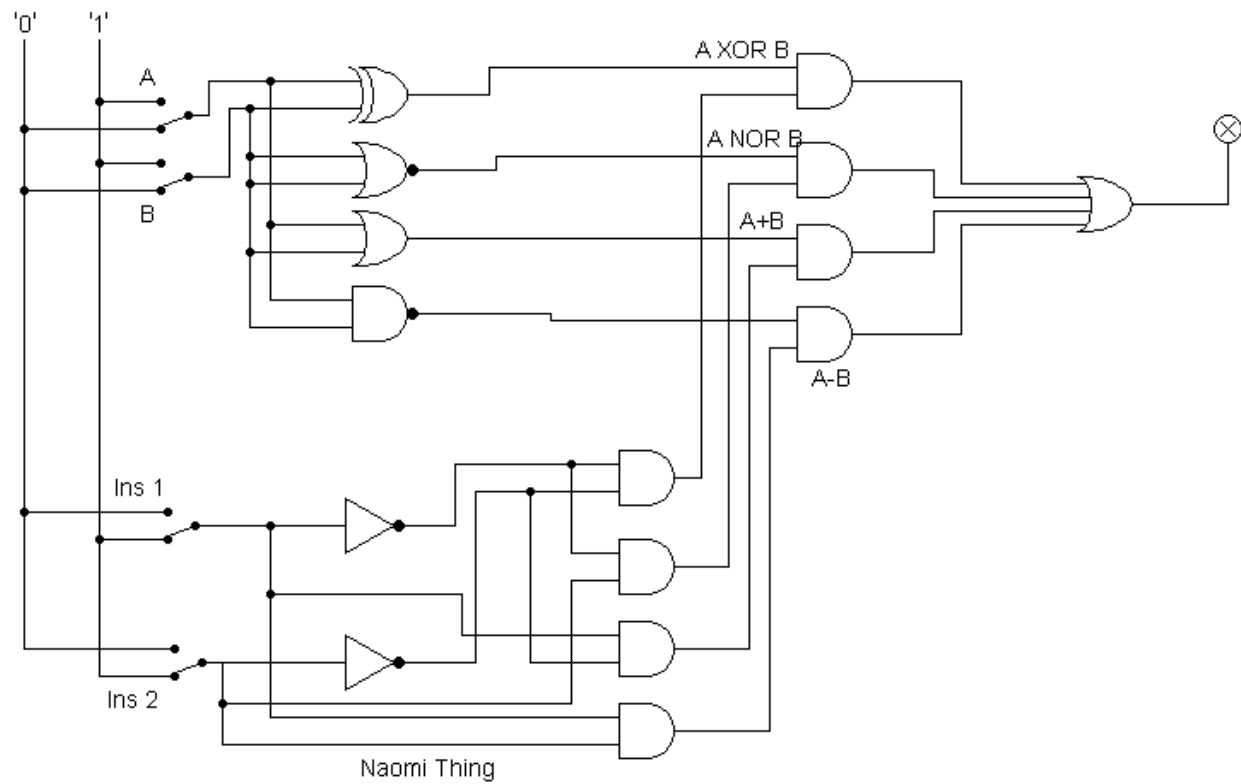   A XOR B
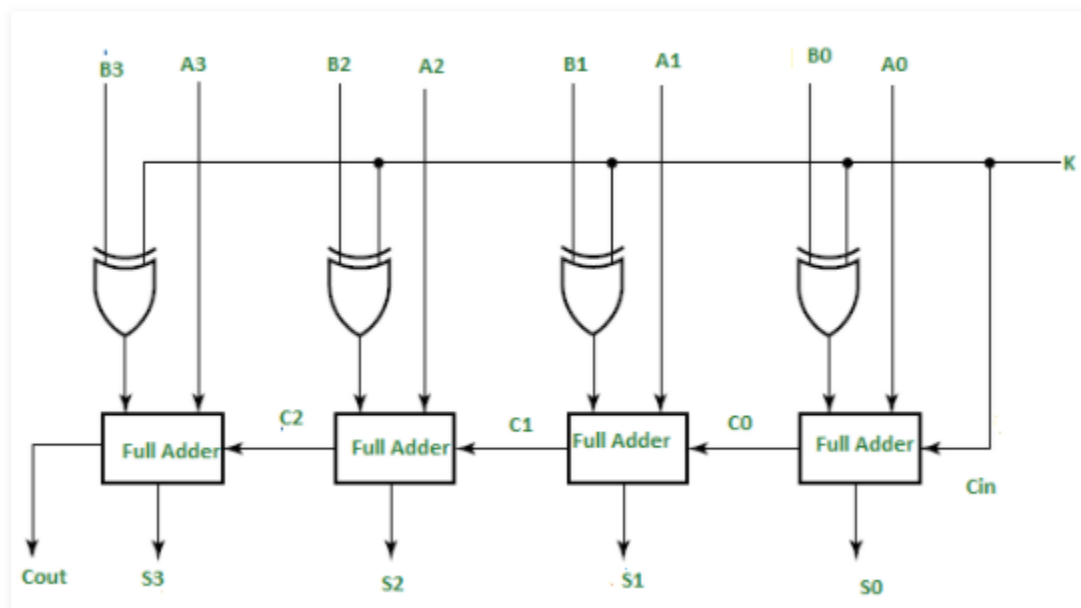
      A NOR B

      A + B

      A – B

Answer:

11. Design a digital circuit that performs the four logical operations of exclusive-OR, NOR, NAND and OR. Use two selection variables. Show the logic diagram of one typical stage. Discuss the working mechanism of the circuit that you have constructed.

Answer:

'0'   '1'

A

B

Ins 1

Ins 2

A XOR B

A NOR B

A+B

A-B

Naomi Thing

'0'   '1'

A

B

Ins 1

Ins 2

A XOR B

A NOR B

A+B

A-B

Naomi Thing

= The above figure represents the ALU, Decoder, and Multiplexer. At first, from the functional unit XOR, NOR, NAND, and OR gate is put in, then from the instructor, it chooses either one of the gates by sending binary result 1. At last, the multiplexer outputs the result after the process.

12. Following diagram shows a 4-bit adder/subtractor. Design the circuit diagram using Logsim. Discuss how the circuit performs addition and subtraction.

Answer:

Naomi Thing