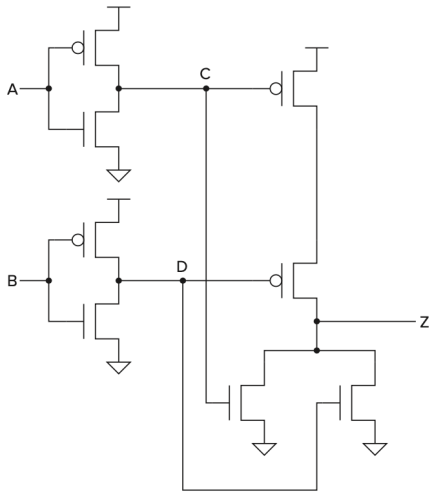
1. 3.6 For the transistor-level circuit in Figure 3.38, fill in the truth table. What is *Z* in terms of *A* and *B*?

A	*B*	*C*	*D*	*Z*



简答题 (2 分) 1 分

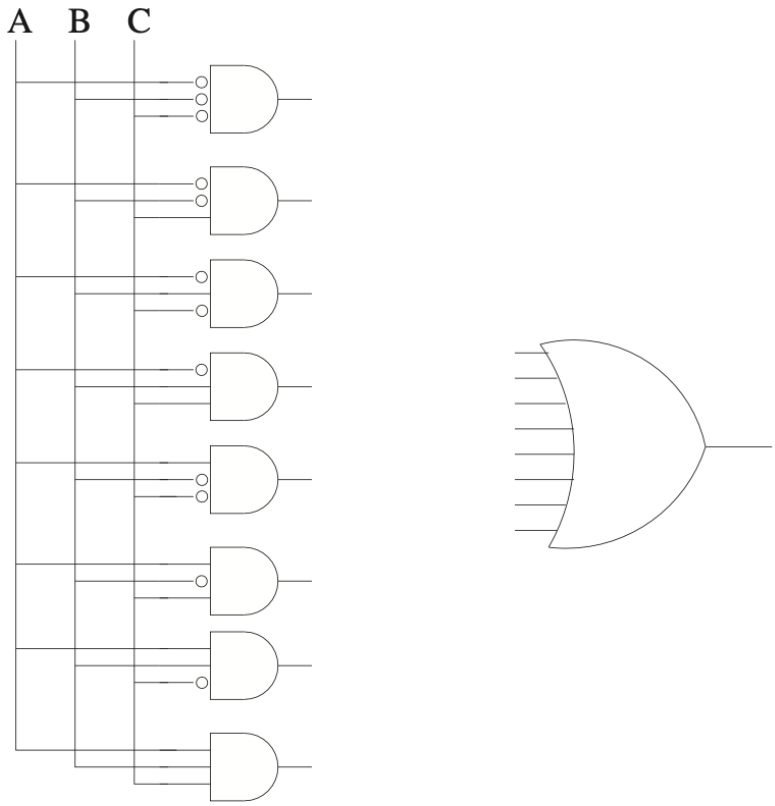
附件名
大小

image-20210712164417416.png

教师评语:
What is Z in terms of A and B?

2. 3.12 A function is described by the truth table shown on the left. Your job: Complete the logic implementation shown on the right by adding the appropriate connections.

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



简答题 (2 分) 0 分

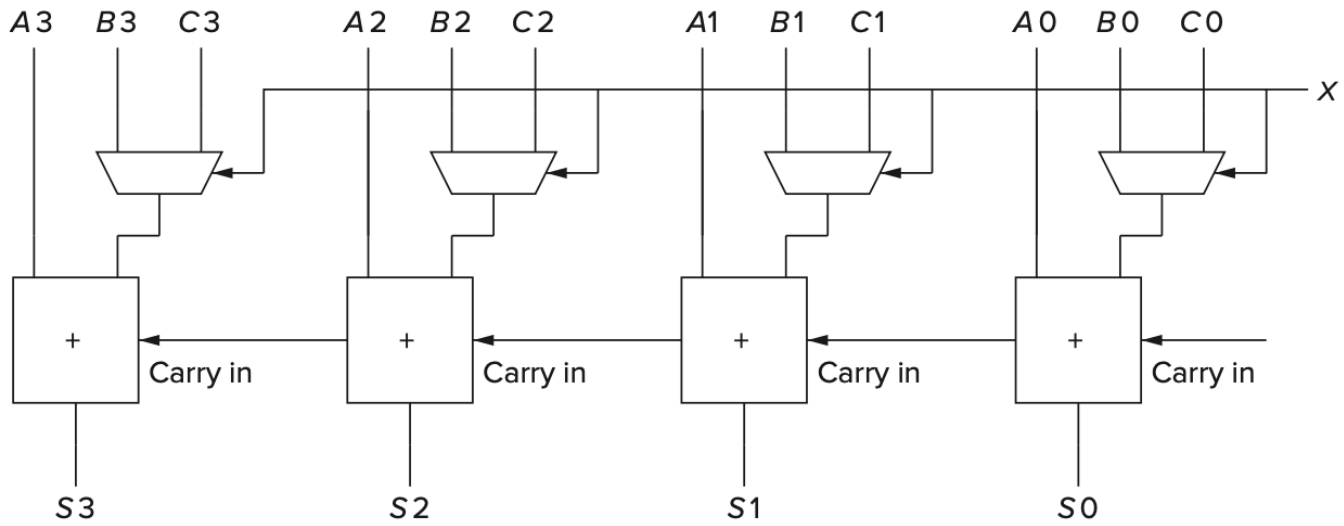
附件名
大小

image-20210712164330539.png

教师评语:
不允许添加元件

3. 3.30 a. Figure 3.42 shows a logic circuit that appears in many of today's processors. Each of the boxes is a full-adder circuit. What does the value on the wire X do? That is, what is the difference in the output of this circuit if $X = 0$ vs. if $X = 1$?

   b. Construct a logic diagram that implements an adder/subtractor.That is, the logic circuit will compute $A + B$ or $A - B$ depending on the value of X. Hint: Use the logic diagram of Figure 3.42 as a building block.



简答题 (2 分) 1 分

A. in the circuit ,x =0; the mux output is Bi;
when x=1, the mux output is Ci.
B. we will choose x=1 and get the ~Ci;

附件名
大小

image-20210712171434599.png

教师评语:
b中C应该不存在

4. 3.38 Distinguish between a memory address and the memory's addressability.

简答题 (2 分) 2 分

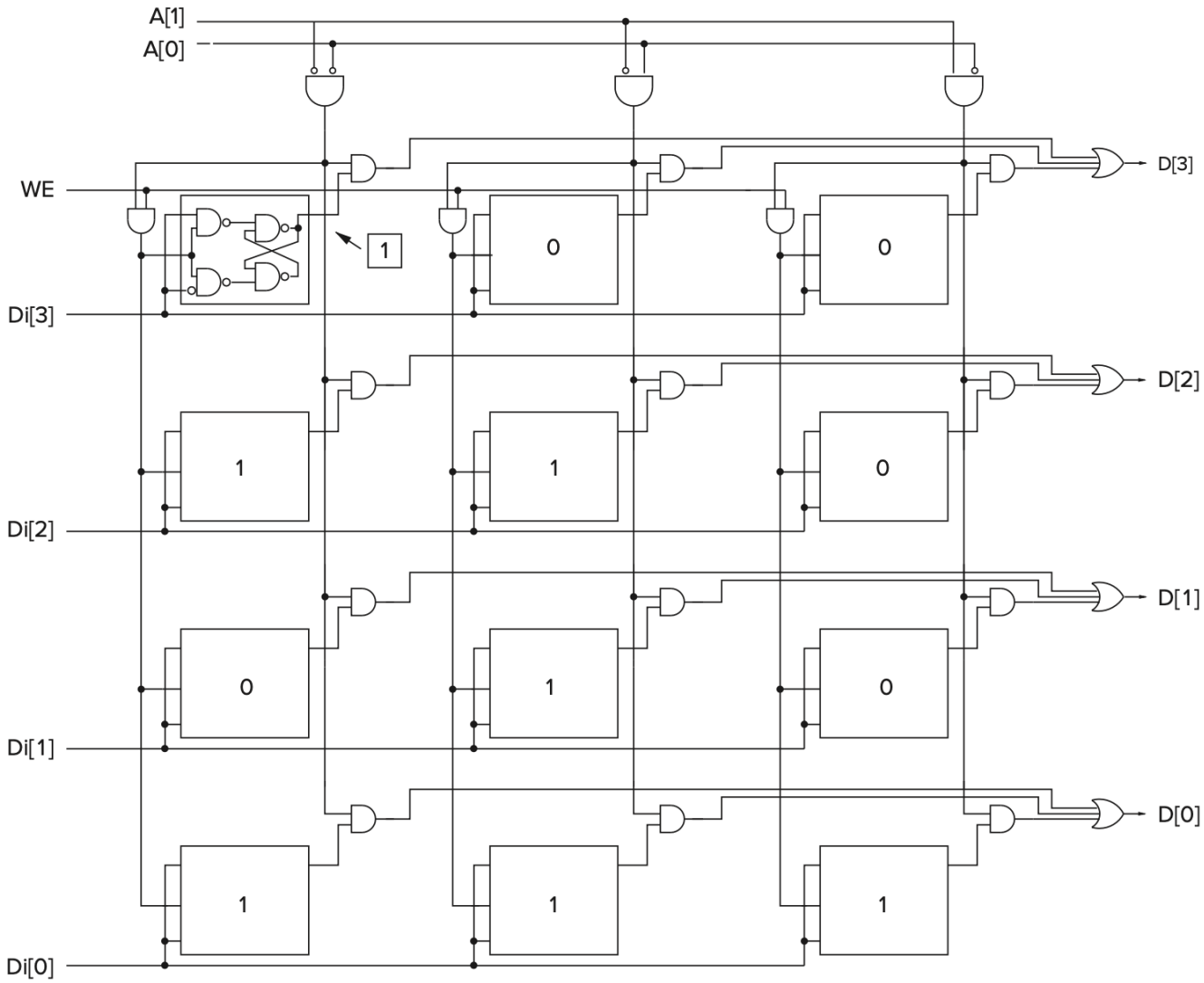
memory address is a address that data located in memory such as 0xFFF1h.etc
memory's addressability is number of bit per location.

5. 3.40 For the memory shown in Figure 3.45:

a. What is the address space?

b. What is the addressability?

c. What is the data at address 2?



简答题 (3 分)　3 分

1. 4
2. 4 bit
3. 0001'b

6. 3.47 The IEEE campus society office sells sodas for 35 cents. Suppose they install a soda controller that only takes the following three inputs: nickel, dime, and quarter. After you put in each coin, you push a pushbutton to register the coin. If at least 35 cents has been put in the controller, it will output a soda and proper change (if applicable). Draw a finite state machine that describes the behavior of the soda controller. Each state will represent how much money has been put in (Hint: There will be seven of these states). Once enough money has been put in, the controller will go to a final state where the person will receive a soda and proper change (Hint: There are five such final states). From the final state, the next coin that is put in will start the process again.

简答题 (2 分) 1 分

附件名
大小

hw.jpg

教师评语:
缺少回到初始状态

7. 3.50 Prove that the NAND gate, by itself, is logically complete (see Section 3.3.5) by constructing a logic circuit that performs the AND function, a logic circuit that performs the NOT function, and a logic circuit that performs the OR function. Use only NAND gates in these three logic circuits.

简答题 (2 分) 2 分

NOT : NAND (A,A) = NOT (A)
AND : NOT(NAND (A,B)) = AND (A,B) = AB
OR: NOT(AND(NAND(A,A) NAND(B,B))) = A+B

附件名
大小

image-20210712164835068.png