

1 (20pt)	2 (20 pt)	3 (20 pt)	4 (20 pt)	5 (20 pt)	Total (100 pt)

1. Show the systematic sequence of transformations when we solve a problem using a computer

Sequence	Explanation	An example

2. Write the Two's complement representation of the decimal numbers given in the table

Decimal Number	Two's complement (1 sign bit + 7bits)
+21	
-21	
+57	
-15	

3. By using the formula below, write the floating point number corresponding to

Binary representation	Floating Point Value
10000101011000000000000000000000	

$1b$	$8b$	$23b$	
S	Exponent	Fraction	

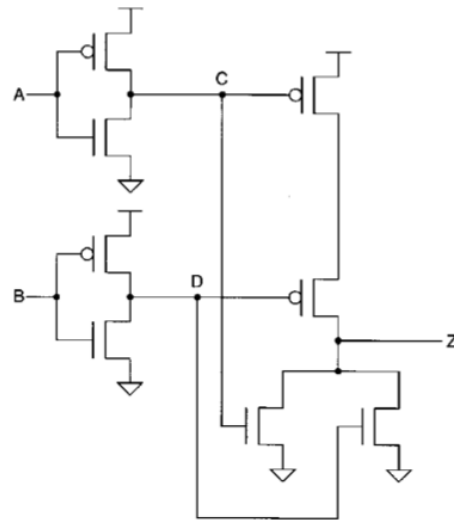
$$N = -1^S \times 1.\text{fraction} \times 2^{\text{exponent}-127}, \quad 1 \leq \text{exponent} \leq 254$$

$$N = -1^S \times 0.\text{fraction} \times 2^{-126}, \quad \text{exponent} = 0$$



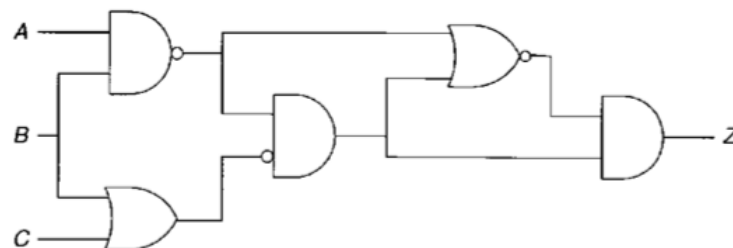
4. For the transistor-level circuit in the figure below, fill in the truth table. What is Z in terms of A and B?

A	B	C	D	Z



5. Given the logic circuit below, fill in the truth table for the output value Z.

A	B	C	Z
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0	0	1	
0	1	0	
0	1	1	
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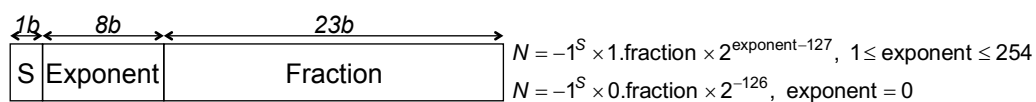
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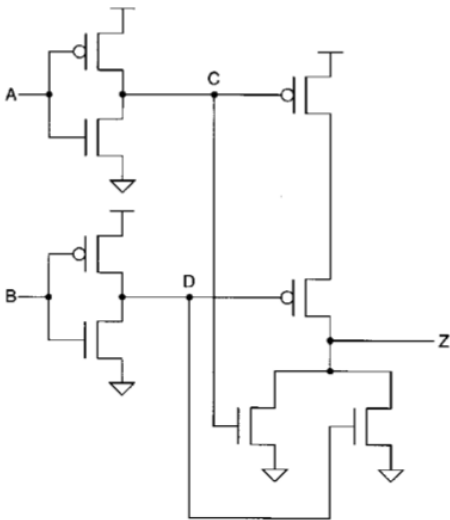
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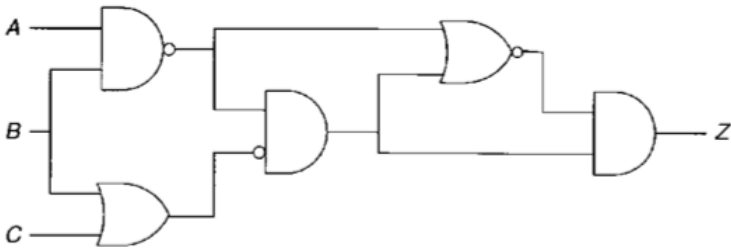
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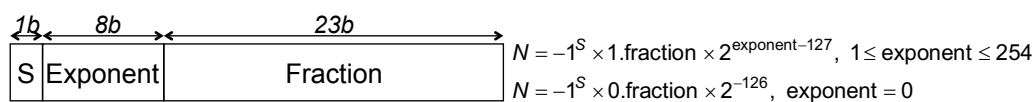
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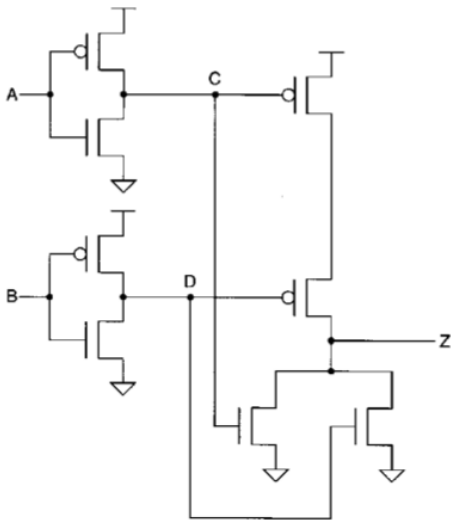
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