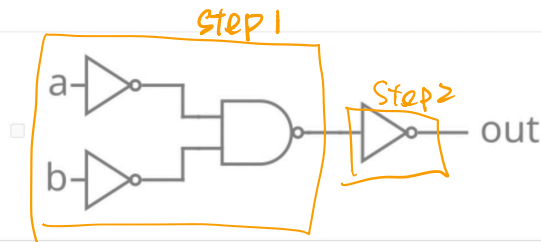


Question 1

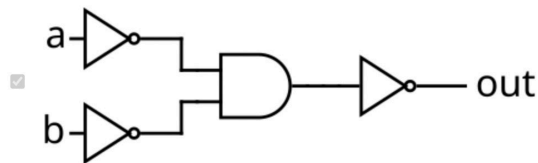
1 / 1 pts

Which of the following logic circuits is equivalent to an OR gate?

Choose all that apply.



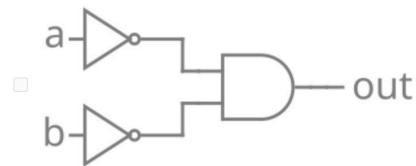
Correct!



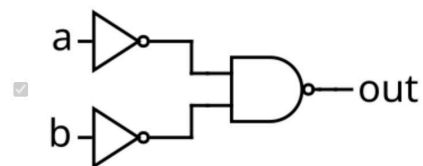
Morgan's law  
 $\overline{(\bar{a} \cdot \bar{b})} = (\bar{\bar{a}} + \bar{\bar{b}})$   
 $\overline{(\bar{a} + \bar{b})} = \bar{\bar{a}} \cdot \bar{\bar{b}}$

Step 1:  $\overline{(\bar{a} \cdot \bar{b})} = a + b$   
 Step 2:  $\overline{(\bar{a} + \bar{b})} = a \cdot b$  X

Step 1:  $\overline{(\bar{a} \cdot \bar{b})} = \bar{\bar{a}} + \bar{\bar{b}}$   
 Step 2:  $\overline{(\bar{a} + \bar{b})} = a \cdot b$  ✓



Correct!



Step 1:  $\overline{(\bar{a} \cdot \bar{b})} = \bar{\bar{a}} + \bar{\bar{b}}$

Step 1:  $\overline{(\bar{a} \cdot \bar{b})} = (\bar{\bar{a}} + \bar{\bar{b}})$   
 $= a + b$

Step 1:  $\overline{(\bar{a} \cdot \bar{b})}$   
 Step 2:  $\overline{(\bar{a} + \bar{b})} = a \cdot b$

Step 1:  $\overline{(\bar{a} \cdot \bar{b})}$   
 Step 2:  $\overline{(\bar{a} + \bar{b})}$

## Question 2

1 / 1 pts

Why do we use two's complement to represent negative numbers in binary?

Choose all that apply.

Correct!

☒ So that we can use the most significant bit as a sign bit

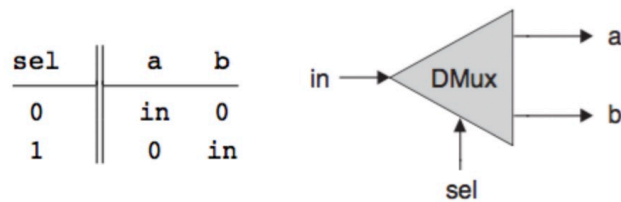
Correct!

☒ So that we can perform addition without worrying about the sign of the numbers

Correct!

☒ So that there is only one representation of 0

Consider the following diagram for a DMUX



**Figure 1.9** Demultiplexor.

where the unselected output wires are set to zero. Would a dmux still be a useful chip if these values were always set to 1?

Correct!

☒

Yes. You might have to invert this signal or change the expected interpretation of this signal.

☐

Yes. It doesn't matter what is on these inputs.

☐

No. The ones make the output of the dmux unpredictable.

☐

No. It would render the dmux useless because all of the rest of the machine would be expecting a zero in this place rather than a one and there is nothing we could do to fix it.

#### Question 4

1 / 1 pts

Which of the following statements about the HDL language used in this course are true.

Choose all that apply.

Correct!



Names of chips and pins may be any sequence of letters and digits not starting with a digit.

DMUX  
OR ...



HDL is a programming language

HDL



HDL keywords are written in lowercase letters

IN, OUT...

Correct!



A chip definition consists of a header and a body. The header specifies the chip interface and the body its implementation.

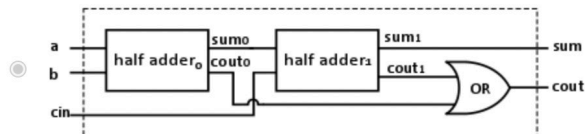
Please refer to textbook Appendix A for more information on HDL.

#### Question 5

1 / 1 pts

The following four schematics try to implement a full adder using half adders. Which one is correct?

Correct!



Excellent.

