Online Test (ver A) - Boolean Logic & Number Systems

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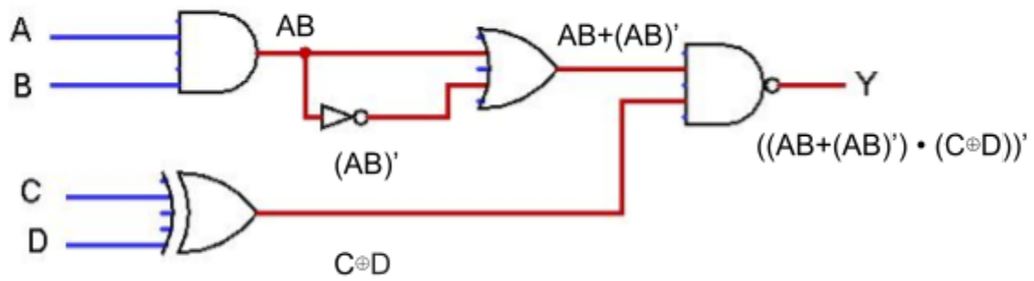
Knowledge [**9.5** / 10]

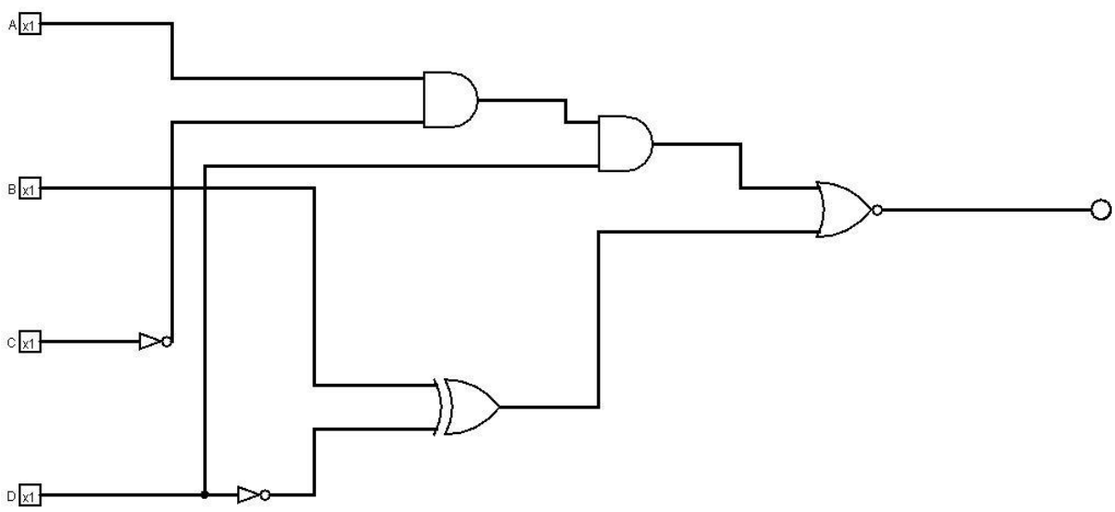
1. Translate the following schematic into its boolean algebraic equivalent. Double-click on the image below and fill in each output at various stages of the circuit and then clearly write out the final answer. [3 marks] **3**



2. Use the Logisim program to draw the schematic diagram for the boolean algebraic expression. Export it as a JPG and paste it in the box below. [4 marks] **4** Do not have more than two inputs per gate. Here is the equation:

$$\overline{A\,\overline{C}\,D + (B \oplus \overline{D})}$$

Paste your picture here and upload a copy of your Logisim file to the Google Classroom Test post.



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3. Simplify the following expression using ONLY theorems and identities used in class. Do not use K-Maps. [3 marks] **2.5**

$$\overline{AB}\ (\overline{A}+B)(\overline{B}+B)$$

Step #	Simplified Equation	Basic Simplification Rule or explanation
	(AB)′ (A′ + B) (B′ + B)	X′ + X = 1
1	(AB)′ (A′ + B) (1)	A • 1 = A
2	(AB)′ (A′ + B)	DeMorgan's Theorem $(\overline{X \bullet Y} = \overline{X} + \overline{Y})$
3	(A′+B′)(A′+B)	Factor A′
4	A′+B′B **Missing steps in between. You need to expand the brackets**	X′ • X = 0
5	A′ + 0	X + 0 = X
6	**A′ Correct answer here**	**Final Solution**