

Student Full Name: _____

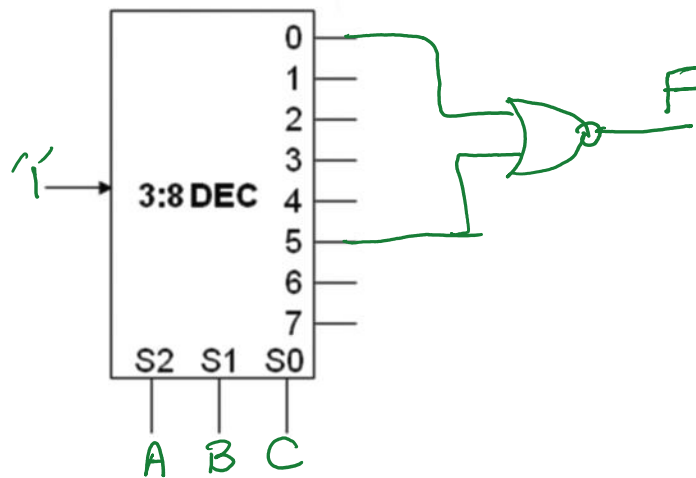
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1. Given the function $W = (A \oplus C) + B$,

a) Fill in the truth-table below. (2 marks)

	A	B	C	W
$0 \equiv$	0	0	0	0
	0	0	1	1
	0	1	0	1
	0	1	1	1
	1	0	0	1
$5 \equiv$	1	0	1	0
	1	1	0	1
	1	1	1	1

b) Given the truth table of part (a), implement W using a single 3:8 decoder shown below and no more than a single 2-input NOR gate. (4 marks)



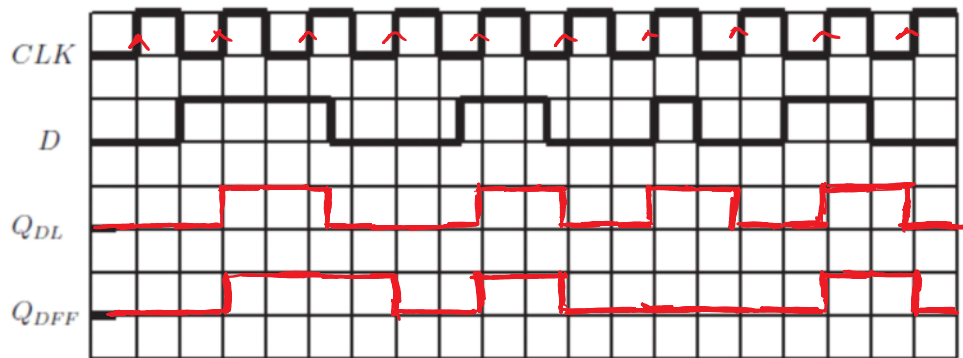
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2. On the following graph, inputs CLK and D are shown. They are inputs to both a D latch and a D flip-flop. CLK goes into the EN of the D latch. Write the output of the D latch as Q_{DL} on the graph. Then write the output of the D flip-flop as Q_{DFF} on the graph. Both outputs are initially 0 at the start of the graph, as shown. Do the two outputs differ, and if so, why?

Either of the following answers can be correct. (4 marks)

1) IF the FF is positive-edge sensitive



2 - IF the D-FF is negative edge sensitive.

