Digital Design - 2015-11-03

ECGR 2181 Quiz 9

Name: _____ Student ID: _____ (1)

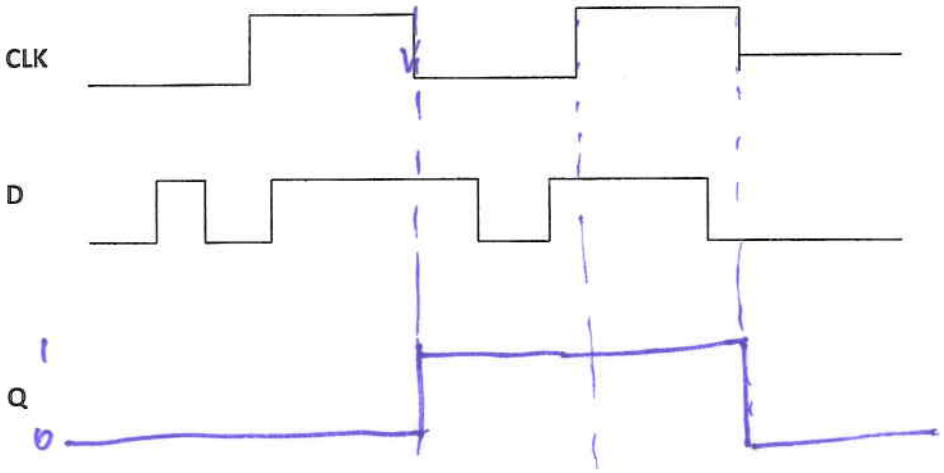
Section: _____ (1 point for clearly printed name)

1. What is the **TIME** and **DATE** of **Exam 2**? (1 point)

2. What is the difference between a Flip Flop and a Latch? (3 points)

Example of another problem

3. Given the following Clock (CLK) and Data Input (D) draw the D Flip-Flop (~~Rising Edge~~ Falling Edge) waveform output (Q) (5 points) , Q starts at 0



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(2)

Question:

Consider the design on page 23 of the notes. How many NOT gates, AND gates, and NOR gates are in the design?

3 registers (5 bit)
each register has 5 D flip-flops
each D flip flop has a NOT gate and 2 D latches
each D latch has one NOT gate, 2 AND gates, and 2 NOR gates

gates latches flip-flops registers

NOR = 2 * 2 * 5 * 3 = 60

AND 2 * 2 * 5 * 3 = 60

NOT ((1 * 2) + 1) * 5 * 3 = 45

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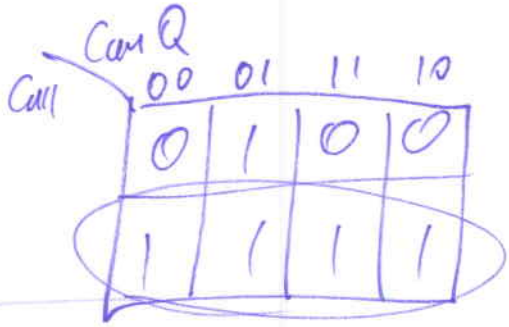
Combinational → Valid Slide 33 (3)

Call	Cancel	Q	D
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1



Call + $\overline{\text{Cancel}}$ Q